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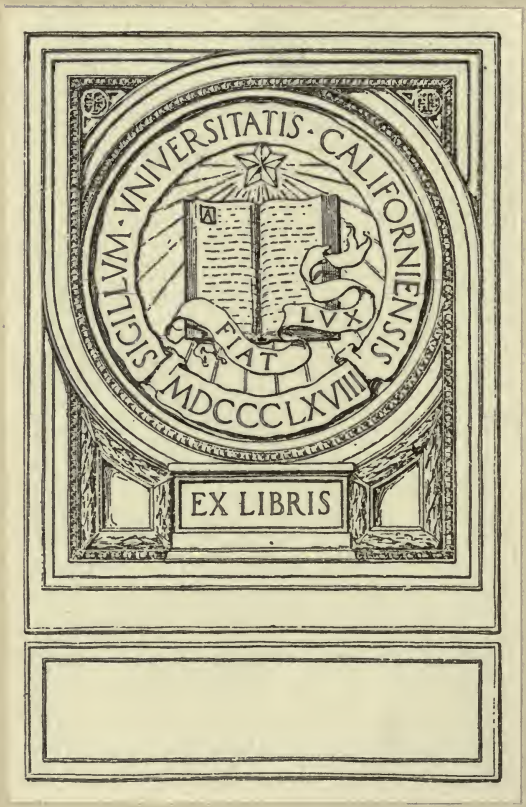
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MEDICAL INSPECTION OF SCHOOLS

By
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AND
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NEW YORK
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PREFACE

THIS volume is a revision of Medical Inspection of Schools, published by the Russell Sage Foundation in October, 1908. The first edition was exhausted within three months, and the volume was reprinted in January, 1909, and again in December of the same year. During the three and a half years that have elapsed since the first publication of the volume there has been a three-fold increase in the number of American cities having systems of medical inspection of schools. In rapidity and extent, this development has been unequalled by that of any other educational movement in America.

During these few years physical examinations have become an integral part of all the more important systems of medical inspection. The school nurse, almost unknown four years ago, is now an important adjunct of the systems of scores of cities. Dental inspection, then in its infancy, is now being carried on in nearly 200 cities. At that time three states and the District of Columbia had legal provisions for medical inspection. Now the number has increased to 20.

These conditions have resulted in an increasing demand for a revision of the original text, and this has led to the preparation of the present volume. While covering much of the matter treated in the original book, the text has been entirely re-written, and the description of methods and forms, as well as the quantitative material, brought down to date. Like its predecessor, this book aims

(1) To be of practical use; (2) to be a reliable source of information as to what is now being done and how it is being done; (3) to be frank in its admission of problems and difficulties as yet unsolved; (4) to avoid all dogmatism, saving that involved in the statement of actual experience.

L. H. G.
L. P. A.

New York, January, 1913

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In the school of the future compulsory education will involve compulsory health.

SIGNIFICANT FACTS

"WE endorse legislation providing for the medical inspection of schools, because extended and varied experience has demonstrated that efficient medical inspection betters health conditions among school children, safeguards them from disease, renders them healthier, happier and more vigorous, and aims to insure for each child such physical and mental vitality as will best enable him to take full advantage of the free education offered by the state."—Extract from Resolutions Adopted by the Conference of State and Provincial Boards of Health, Los Angeles, June 30–July 1, 1911.

Medical inspection is a movement national in scope in England, France, Germany, Norway, Sweden, Austria, Switzerland, Belgium, Japan, Australia and Tasmania. It is found in the more important cities in Denmark, Russia, Bulgaria, Egypt, Canada, Mexico, the Argentine Republic, and Chili. In the United States regularly organized systems are in force in nearly one-half of the cities, while a beginning has been made in nearly three-fourths of them.

Medical inspection of schools had its inception some eighty years ago, and during the past quarter of a century it has assumed the proportions of a world-wide movement. It is found in all the continents and the extent of its development in different countries is in some measure proportionate to their degree of educational enlightenment.

Clear distinction must be made between medical inspection, solely for the detection of communicable disease, and physical examinations which aim to discover defects, diseases, and physical abnormalities. The former relates primarily to the immediate protection of the community, while the latter looks to securing and maintaining the health and vitality of the individual.

Medical inspection for the detection of contagious diseases may well be a function of the board of health, for it aims at the

protection of the community. Physical examinations for the detection of non-contagious defects should be conducted by the educational authorities, or at least with their full coöperation, because they are made for educational purposes. The records of physical examinations must be constantly and intimately connected with school records and activities. They do not need to be connected with other work of the board of health.

At the beginning of the year 1912, seven states had mandatory laws providing for medical inspection, 10 had permissive ones, and in two states and the District of Columbia, medical inspection was carried on under regulations promulgated by the state boards of health and having the force of laws.

Professor William Osler, the distinguished English physician, is credited with saying in regard to the work of medical inspection in England, "If we are to have school inspection, let us have good men to do the work and let us pay them well. It will demand a special training and a careful technique."

The school nurse is the most important adjunct of medical inspection. She is the teacher of the parents, the pupils, the teachers, and the family, in applied practical hygiene. She is the most effective possible link between the school and the home.

Dental inspection is rapidly becoming one of the most important branches of medical inspection. First in Germany, next in England, and more recently in the United States, dental inspection has been inaugurated and school dental clinics established. The work is now being carried on in nearly 200 American cities.

In terms of financial expenditure, the cheapest sort of medical inspection consists of examinations conducted by teachers for the discovery of defects of vision and hearing. These involve only the added expense of the simple printed material required. Inspection by physicians for the detection of contagious diseases costs about 10 cents per child per year. Systems including both inspections for contagious diseases and examinations to detect physical defects cost on the average about 25 cents per child per year. Where school nurses are employed, the average per capita

rate is about 30 cents per child per year, and this may probably be regarded as a minimum cost for adequate and efficient work.

In foreign countries complete physical examinations are usually conducted only two or three times in the course of the child's school career. In this country most cities attempt to conduct such examinations every year and frequently fall far short of accomplishing their aim. A conservative standard efficiently maintained is better than a high ideal that is never reached.

In American cities having relatively efficient systems of medical inspection, the number of defective pupils receiving remedial treatment as a result of the examinations ranges from about 10 per cent to about 50 per cent. In England the work is more efficient and from 20 per cent to 70 per cent of the defective children receive remedial treatment from physicians, oculists, or dentists.

Medical inspection is essential in country districts as well as in large cities, and in rich communities as well as in poor ones. The locality has yet to be discovered in which the medical inspection of school children is unnecessary or undesirable.

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CHAPTER I

THE ARGUMENT FOR MEDICAL INSPECTION

MEDICAL inspection is an extension of the activities of the school in which the educator and the physician join hands to insure for each child such conditions of health and vitality as will best enable him to take full advantage of the free education offered by the state. Its object is to better health conditions among school children, safeguard them from disease, and render them healthier, happier, and more vigorous. It is founded upon a recognition of the intimate relationship between the physical and mental conditions of the children, and the consequent dependence of education on health conditions.

When Boston initiated medical inspection in America in 1894, by dividing her schools into 50 districts and placing a physician in charge of each district, she did so in the hope that the new measure would curb the waves of contagious disease that repeatedly swept through the ranks of the children, leaving behind a record of suffering and death. The experiment was successful, and when other cities learned how Boston was solving the problem, they too began to employ school physicians and to organize systems of medical inspection.

During the first years the spread of the movement was slow, only one or two cities taking it up each year; then these pioneers were followed by dozens of their sister cities, later by scores, and in the past few years by hundreds.

This sudden recognition of the imperative necessity for safeguarding the physical welfare of school children grew out of the discovery that compulsory education under modern city conditions meant compulsory disease.

With the great changes which have been coming over American life, former conditions have disappeared and undisturbed indifference to the physical welfare of our school children has become impossible. We have changed from an agricultural

people to a race of dwellers in towns and cities. The school year has changed from a three months' winter term to one of five hours per day for ten months during the year. The number of years of school life has greatly increased. We have passed compulsory education laws. Going to school has become not only the normal but the required occupation of all children for a considerable number of years.

The results of these changed conditions on the health of children have become so marked as insistently to demand attention. The parents, school authorities, and health authorities have been unable to avoid recognizing the fact that in the nature of the case the school has become the most certain center of infection in the community.

The state, to provide for its own protection, has decreed that all children must attend school, and has put in motion the all-powerful but undiscriminating agency of compulsory education, which gathers in the rich and the poor, the bright and the dull, the healthy and the sick. The object was to insure that these children should have sound minds. One of the unforeseen results was to insure that they should have unsound bodies. Medical inspection is the device created to remedy this condition. Its object is prevention and cure.

Wherever established, the good results of medical inspection have been evident. Epidemics have been checked or avoided. Improvements have been noted in the cleanliness and neatness of the children. Teachers and parents have come to know that under the new system it is safe for children to continue in school in times of threatened or actual epidemic.

But medical inspection does not stop here, nor has it limited its activities to the field outlined. Other problems have been insistently forcing themselves on the attention of school men; and they, knowing something of the wonderful advances made in the field of medicine, have turned for aid to the physicians.

With the changes in the length of the school term, and the increase in the number of years of schooling demanded of the child, has come a great advance in the standards of the work required. When the standards were low, the work was not beyond the capacity of even the weaker children; but with close grading, fuller

courses, higher standards, and constantly more insistent demands for intellectual attainment, conditions have changed. Pupils have been unable to keep up with their classes. The terms "backward," "retarded," and "exceptional," as applied to school children, have been added to the vocabularies of school men.

School men discovered that the drag-net of compulsory education was bringing into school hundreds of children who were unable to keep step with their companions, and because this interfered with the ordinary administration of our school systems they began to ask why the children were backward.

The school physicians helped to find the answer when they showed that hundreds of these children were backward simply because of removable physical defects. And then came the next great forward step, the realization that children are not dullards through the will of an inscrutable Providence, but rather through the law of cause and effect.

This led to an extension of the scope of medical inspection to include the physical examination of school children with the aim of discovering whether or not they were suffering from such defects as would handicap their educational progress and prevent them from receiving the full benefit of the free education furnished by the state. This work was in its infancy five years ago, but today more than 200 American cities have systems of physical examination of their school children.

Surprising numbers of children have been found who, through defective eyesight, have been seriously handicapped in their school work. Many are found to have defective hearing. Other conditions are found which have a great and formerly unrecognized influence on the welfare, happiness, and mental vigor of the child. Attention has been directed to the real significance of adenoids and enlarged tonsils, of swollen glands and carious teeth.

Communities are seeing the whole matter in a new light. Gradually they are beginning to ask, not whether they can afford to take steps to safeguard in schools the welfare of their children, but whether they can afford not to take such steps. The realization is dawning that it is unbusinesslike to count carefully the cost of the school physician, but to disregard the cost of death and disease, of wrecked hopes and dependent families.

Teachers and parents are beginning to realize that the problem of the pupil with defective eyesight may be quite as important to the community as that of the pupil who has some contagious disease. A child who is unable to see distinctly is placed in a school where physical defects are unrecognized and disregarded; headaches, eyestrain, and failure follow all his efforts at study. He cannot see the blackboards and charts; printed books are indistinct or are seen only with much effort, everything is blurred. Neither he nor his teacher knows what is the matter, but he soon finds it impossible to keep pace with his companions, and, becoming discouraged, he falls behind in the unequal race.

In no better plight is the child suffering from enlarged tonsils and adenoids, which prevent proper nasal breathing and compel him to keep his mouth open in order to breathe. Perhaps one of his troubles is deafness. He is soon considered stupid. This impression is strengthened by his poor progress in school. Through no fault of his own he is doomed to failure. He neglects his studies, hates his school, leaves long before he has completed the course, and is well started on the road to an inefficient and despondent life.

Public schools are a public trust. When the parent delivers his child to their care he has a right to insist that the child under the supervision of the school authorities shall be safe from harm and shall be handed back to him in at least as good condition as when it entered school. Even if the parent does not insist upon it, the child himself has a right to claim protection. The child has a claim upon the state and the state a claim upon the child which demands recognition. Education without health is useless. It would be better to sacrifice the education if, in order to attain it, the child must lay down his good health as a price. Education must comprehend the whole man and the whole man is built fundamentally on what he is physically.

The objection that the state has no right to permit or require medical inspection of the children in the schools will not bear close scrutiny or logical analysis. The authority which has the right to compel attendance at school has the added duty of insisting that no harm shall come to those who go there. The Massachusetts law, with its mandatory "shall," is certainly preferable

Mouth breathing means adenoids; adenoids mean deadened intellects.

to the Connecticut law, with its permissive "may." The exercise of the power to enforce school attendance is dangerous if it is not accompanied by the appreciation of the duty of seeing that the assembling of pupils brings to the individual no physical detriment. When the subject is considered both from the standpoint of the individual and from that of the state, the wonder is, not that medical inspection is now being practiced, but rather that it was not begun long ago.

Nor is the state, in assuming the medical oversight of the pupils in the public schools, trespassing upon the domain of private rights and initiative. Under medical inspection what is done for the parent is to tell him of the needs of his child, of which he might otherwise have been in ignorance. It leaves to the parent the duty of meeting those needs. It leaves him with a larger responsibility than before. Whatever view be taken of the right of the state to enforce measures for the correction of defects discovered, the arguments for and against do not enter into the present discussion. It is difficult to find a logical basis for the argument that the state has not the right to inform the parents of defects present in the child, and to advise as to remedial measures which should be taken to remove them.

The justification of the state in assuming the function of education and in making that education compulsory is to insure its own preservation and efficiency. Whether or not it is to be successful will depend on the intelligence of its individual members.

But the well-being of a state is as much dependent upon the strength, health, and productive capacity of its members as it is upon their knowledge and intelligence. In order that it may insure the efficiency of its citizens, the state through its compulsory education enactments requires its youth to pursue certain studies which experience has proved necessary to secure that efficiency. Individual efficiency, however, rests not alone on education or intelligence, but is equally dependent on physical health and vigor. Hence, if the state may make mandatory training in intelligence, it may also command training to secure physical soundness and capacity.

Much time may elapse before there will be put in practice in all schools the measures, now so successfully pursued in some,

for conserving and developing the physical soundness of rising generations. But the movement is so intimately related to the future welfare of our country, and has so signally demonstrated its value, that it is destined to be universal and permanent.

For nineteen centuries the educational world has held as the most perfect expression of its philosophy that half line of Juvenal in which he pleads for the sound mind in the sound body. It has remained for the first decade of the twentieth century to awake to a startled realization that Juvenal was wrong—wrong because he bade us think that mind and body are separate, and separately to be provided for.

Only now have we come to realize the error and to take steps to rectify it. Only in the last few years have we begun to see that, educationally at least, mind and body are inseparable, and that the sound mind and the sound body are inextricably related—both causes and both effects.

All these things mean that it is our splendid privilege to see and to be a part of a movement which is profoundly transforming our traditional ideas of education. They mean that our children and our children's children will be a better race of men and women than are we or than were our fathers.

Not alone our unwillingness to be outdone in this public service by foreign nations, not alone our sense of practical foresight, but our inherent feeling of obligation toward our children and our recognition of this service as one of necessity for the national well-being, are forcing upon us the incorporation of this phase of public activity as an integral part of our public education.

The human race will be a better race because of the lessons that have been taught us by the child having contagious disease, the backward child, and the physically defective child. Because of these lessons, the youth of the future will attend a school in which health will be contagious instead of disease, in which the playground will be as important as the book, and where pure water, pure air, and abundant sunshine will be rights, and not privileges. He will attend a school in which he will not have to be truant, tuberculous, delinquent, or defective, to get the best and fullest measure of education.

CHAPTER II

HISTORY AND PRESENT STATUS

MEDICAL inspection of schools was first provided for some eighty years ago but it is only during the past quarter of a century that it has assumed the proportions of a world-wide movement. It is found in all the continents, and the extent of its development in different countries is in some measure proportionate to their degree of educational enlightenment. In the most important countries it has now become national in scope.

France

The earliest work in the field of medical inspection seems to have been done in France, where the law of 1833 and the royal ordinance of 1837 charged school authorities with the duty of providing for the sanitary conditions of school premises and supervising the health of the school children. A few years later, in 1842 and 1843, governmental decrees were promulgated in Paris, directing that all public schools should be regularly inspected by physicians. In spite of these early beginnings, however, it was not until 1879 that genuine medical inspection in the modern sense of the term was begun in France. In that year the general council of the Department of the Seine reorganized the medical service in the schools of Paris and passed an appropriation for the payment of salaries to the physicians. Eight years later medical and sanitary inspection were made obligatory in all French schools, public and private.

At the present time the work is carried on in Paris by a force of 210 school physicians who are selected on the basis of competitive examination and each of whom has supervision of not more than 1,000 children. These physicians visit each school at least twice every month and make careful examinations of the sanitary conditions, paying special attention to lighting, ventila-

tion, cleanliness, and water supply. Visits are made to each school room and a general inspection of the pupils conducted. Following this general inspection, individual examinations are conducted in the inspector's private room. The children examined are of three classes: first, those whom the physicians have selected as apparently needing special attention; second, those referred to them by teachers and parents; and third, those who have returned to school after absence because of illness or some unknown cause.

The first object of the examinations referred to is to detect and exclude cases of contagious disease. In addition to these inspections each child, during the first months of his school life, is given a thorough physical examination, and a careful record of the findings, entered on an individual record sheet, follows the child through his subsequent school career. Every six months measurements of height and weight are made and the results entered on these record sheets, together with data of any illnesses suffered during the period, and the results of subsequent physical examinations. Parents are informed of any defect or disease discovered and urged to secure remedial treatment.

In other cities of France the systems followed are modeled after that of Paris, but in general are less thorough, and in the smaller places are not infrequently restricted to inspections for the detection and exclusion of cases of contagious disease.

Germany

In Germany the city of Dresden began medical inspection in 1867, when tests of vision were instituted. The first genuine system of medical inspection, however, appears to have been inaugurated by Frankfort-on-the-Main, which appointed a school physician in 1889, an example which was soon followed by many other localities.

In the city of Wiesbaden a plan was developed that was widely copied and became a model, not only throughout the empire but in other countries. The plan adopted by the physician on his monthly visits to each school closely resembles that already described as being followed in Paris. General inspections are first made of class rooms and school premises and these

are followed by individual examinations of pupils selected because they are suspected of suffering from contagious diseases. Previous to entering, each child has been given a physical examination, and this is repeated in the second, fourth, sixth, and eighth years of school life. On each of these occasions an examination of heart, lungs, throat, spine, skin, and the higher sense organs is made, and (in the case of boys) an examination for hernia. The findings are entered on a report blank which accompanies the child from grade to grade. Twice a year the teacher records the height and weight of individual pupils. Whenever it is deemed necessary, the school physician takes chest measurements. The records of children who seem to require the regular care of a physician are marked accordingly, and these children report at regular intervals to the school physician. It is the duty of the school physician to give advice to the teacher with reference to the child. Parents are notified of the results of the examinations.

There is wide variation in the thoroughness of medical inspection in different parts of the empire. Thoroughly organized systems under state regulations exist only in Saxe-Meiningen and Hesse-Darmstadt where every school, both public and private, in the country as well as in the city, is provided with a state-appointed physician. In other states the school physicians are appointed by and work under the municipal Magistrat, the local board of education, or the board of health.

In the year 1908 some 400 towns and cities had systems of medical inspection of schools, employing about 1,600 physicians. There are three common plans of employing and remunerating these school physicians. Under the first form of organization the physician is employed on full time, is paid a salary ranging from $1,750 to $2,750 per annum, and has the right to a pension. Under the second plan, a salary of from $150 to $250 a year is paid for part time services, and work is usually carried on in addition to other public health services, for which separate payment is made. Under the third plan, payment is made on a per capita basis, according to the number of children inspected, and the scale of payment ranges from 6 to 16 cents per child per year, the average being about 12 cents. Payment is also sometimes made at the rate of from 60 cents to $1.00 for each class examined.

As yet the movement for the employment of school nurses has not made great progress in Germany, Charlottenburg and Stuttgart being, in 1910, the only cities having nurses. On the other hand, notable progress has been made in the development of other movements closely allied to medical inspection, such as open air schools, school feeding, dental inspection, and the organization of special classes for exceptional children.

Great Britain*

In England and Wales the medical inspection of schools is carried on under the provisions of the Education Act of 1907 which is mandatory in nature. In Scotland the work is carried on under the Education Act of 1908 which confers on school boards the powers necessary for a universal system of medical inspection. In Ireland alone compulsory medical inspection does not exist. Such work as is carried on is in the main performed by the school inspectors of the national board of education, who are not medical men.

The object of medical inspection in Great Britain, as stated by the memorandum of the board of education, is "to secure ultimately for every child, normal or defective, conditions of life compatible with that full and effective development of its organic functions, its special senses, and its mental powers, which constitute a true education." †

While medical inspection in England has been universal and compulsory only since the passage of the Act of 1907, it has existed in London since 1891, when the first school physician was appointed. From that date up to the passage of the National Act the development of the movement was sporadic. The details of organization are in the main left in the hands of the local authorities, subject to the minimum requirements laid down by the memorandum of the board of education. These minimum provisions include the physical examination of each pupil at the time of his entrance to a public elementary school, and if possible three subsequent examinations, the first of which takes place during the third year of school life or about the seventh year of age,

* For full discussion of the English law, and methods of enforcement, see p. 174 ff. † See p. 176.

the second during the sixth year of school life or about the tenth year of age, and the third at the time the child is about to leave school and go to work.

England was the pioneer in the employment of school nurses, the first having been appointed in London as early as 1887. However, the first school nurses in the modern acceptation of the term were appointed in 1901 by the London school board, and their employment is now becoming general in other cities.

Other Countries

In Belgium medical inspection is the rule in the more important municipalities, and Brussels is credited with having established the first system of medical inspection in the full modern sense of the term in 1874, when school physicians were appointed and charged with the duty of inspecting every school three times a month. This system was remarkably successful from its inception, was copied in other cities of Belgium, and served as a model for systems in Switzerland. Some of the earliest work of school dentists and oculists was done in Belgium.

In Norway medical inspection has progressed steadily since 1885, when some localities began to support regular school physicians. Permissive regulations were passed in 1889 and were followed two years later by mandatory ones.

Sweden is probably the country where the term "school physician" was first used in its modern sense. As far back as 1868 medical officers were attached to the staff of every public secondary school. Their duties and spheres of activity have been progressively extended, beginning first with the higher schools, and since 1895 including the primary ones.

In Denmark there is no regular system of medical inspection nor any legislation directly providing for it. Nevertheless, some work is carried on in the elementary and secondary schools of her larger towns and cities, Copenhagen having led the way in 1896.

Russia has made provision for medical inspection since 1871 but with a few exceptions it has not extended beyond the secondary and higher schools.

Austria was the first country to enact effective legislation providing for medical inspection in the elementary schools, by a

ministerial decree of 1873 which provided for the regular employment of school physicians. In Hungary the office of school physician was established by the act of 1885.

In Bulgaria organized work dates from 1904, while in Roumania adequate legislation has existed since 1899.

In Switzerland the medical inspection of schools and school children is recommended, but not enforced, by the federal government. Nevertheless some 13 cantons now carry out the recommended inspection and thorough work is done by the school physicians of some cities.

In Japan medical inspection has been compulsory and universal since 1898, only small towns and country districts being exempt.

In Egypt, Cairo appointed the first school physician in 1882, and the system has been in force ever since.

In Australia and Tasmania the work dates from 1906 and includes not only measures for the prevention of contagious diseases but physical examinations, together with much scientific study of results. This renders the reports from these countries unusually valuable.

In America a number of countries besides the United States have more or less fully developed systems of medical inspection. In Canada, Montreal began in 1906 with the appointment of 50 school physicians. Halifax and Vancouver followed in 1907. In all of the provinces there is inspection; and in Ontario, Manitoba, and Alberta, it is provided for by law.

In Mexico medical inspection dates from 1896, when the department of medical inspection and school hygiene was organized under the director general of elementary instruction and a few physicians were appointed. Since that time there have been several reorganizations of the system, with constant extension. In the city of Mexico and its suburbs, it is now very complete and notably efficient. From the capital the work has spread until it is now fully organized in the state of Chihuahua, and partly so in Guanajuato and San Luis Potosí.

In South America, the Argentine Republic and Chile began medical inspection in 1888 and in both countries the systems are thoroughly developed.

A throat culture in time may save nine weeks of diphtheria.

DEVELOPMENT AND PRESENT STATUS IN THE UNITED STATES

Boston was the first city in the United States to establish a regular system of medical inspection, starting in 1894 with a staff of 50 school physicians. The movement came as a result of a series of epidemics among the school children. Chicago began in 1895. New York City followed in 1897 when the board of health appointed a corps of 134 medical inspectors for the public schools, and Philadelphia in 1898. In all these instances medical inspection in its inception had as its sole object the reducing of the number of cases of contagious disease among the pupils. The movement rapidly spread from the greater cities to the smaller ones, the first step in many cases being taken by a local medical society offering to carry on the work for a limited time without expense to the municipality, in order to demonstrate its desirability.

Beginnings of State Legislation *

So rapidly and convincingly did the movement establish itself that it was soon provided for by laws in the more progressive states. In 1899 the legislature of Connecticut passed a law providing for the testing of vision in all the public schools of the state. New Jersey authorized boards of education to employ medical inspectors in 1903. In the following year Vermont enacted a law requiring the annual examination of the eyes, ears, and throats of school children.

The first mandatory legislation providing for state-wide medical inspection in all public schools was passed by Massachusetts in 1906.† From these beginnings the movement spread rapidly until by 1912 seven states had passed mandatory laws, 10 had passed permissive ones, and in two states and the District of Columbia medical inspection was carried on under regulations promulgated by the boards of health and having the force of law.‡ The fact that the Massachusetts statute, passed in 1906, is the oldest of the laws now in force, shows that the whole body of legislative enactments which crystallize the views, beliefs, and the

* See also Chap. XII, Legal Provisions, p. 164 ff.
† See pp. 164, 168, and 177. ‡ See map, p. 165.

results of experience of educators and physicians, is of distinctly recent origin.

Present Status

The best body of evidence as to the present status of medical inspection in American municipalities is furnished by the results of an investigation conducted by the Russell Sage Foundation during the school year 1910–11. This investigation gathered the facts on medical inspection and school hygiene from 1,046 school systems in 1,038 cities and towns, or nearly 90 per cent of the American municipalities which have regularly organized systems of public schools under superintendents. For the purpose of tabulating the results, the states of the union were divided into five groups, following the order adopted by the Bureau of the United States Census. These groups are as follows:

	NORTH ATLANTIC DIVISION	
Maine	Massachusetts	New York
New Hampshire	Rhode Island	New Jersey
Vermont	Connecticut	Pennsylvania
	SOUTH ATLANTIC DIVISION	
Delaware	Virginia	South Carolina
Maryland	West Virginia	Georgia
District of Columbia	North Carolina	Florida
	SOUTH CENTRAL DIVISION	
Kentucky	Mississippi	Arkansas
Tennessee	Louisiana	Oklahoma
Alabama	Texas	
	NORTH CENTRAL DIVISION	
Ohio	Wisconsin	North Dakota
Indiana	Minnesota	South Dakota
Illinois	Iowa	Nebraska
Michigan	Missouri	Kansas
	WESTERN DIVISION	
Montana	Arizona	Washington
Wyoming	Utah	Oregon
Colorado	Nevada	California
New Mexico	Idaho	

Forty-three per cent of the cities and towns which reported to the Foundation had regularly organized systems of medical inspection in their public schools. The number of municipalities reporting, the number having systems of medical inspection, and the per cent having such systems in each state group, are shown in the following table:

TABLE I.—CITIES OF UNITED STATES HAVING MEDICAL INSPECTION, BY GROUPS OF STATES. 1911

Division	*Cities reporting*	Cities having medical inspection	
		Number	*Per cent*
North Atlantic	411	236	57
South Atlantic	74	23	31
South Central	101	35	35
North Central	382	109	29
Western	70	40	57
United States	1,038[a]	443	43

[a] Representing 1,046 school systems.

The percentage figures in the final column show that medical inspection has made the best progress in the North Atlantic and Western divisions, where 57 per cent of the cities had taken up the new work. In the two southern divisions the percentages are 31 and 35, and the poorest showing is made by the North Central division, where only 29 per cent of the cities had medical inspection systems.

It has been stated that the first system of medical inspection was inaugurated by Boston in the year 1894. Ten years later, in 1904, 36 cities and towns had such systems. From this time on, the increase was exceedingly rapid until in 1911, as shown above, the number of municipalities which had systems of medical inspection had increased to nearly 450. Out of the 443 cities and towns reporting systems of medical inspection, 32 did not state the year in which work began. From the records of the 411 cities

which gave this information a table has been compiled showing the total number of cities having medical inspection systems in each year since the pioneer work in Boston.

TABLE 2.—CITIES OF UNITED STATES HAVING SYSTEMS OF MEDICAL INSPECTION IN EACH YEAR FROM 1894 TO 1911

Year	*Cities having medical inspection*
1894	4
1897	5
1898	8
1899	9
1900	11
1901	17
1902	23
1903	28
1904	37
1905	55
1906	77
1907	111
1908	167
1909	263
1910	400
1911	411

The reason for the comparatively slight increase in the year 1911 is that the data were gathered in the early spring, so that cities which adopted medical inspection later in the year were not included.

The chart on page 17 represents graphically the number of cities having medical inspection each year since 1894, and shows how the growth of the movement, at first slow and gradual, has become in the later years increasingly rapid.

School Physicians

The returns of the investigation show that 354 of the 443 cities having systems of medical inspection, or about 80 per cent of them, employed school physicians, and that the total number of physicians employed was 1,415. More than half of these were in the North Atlantic states and more than half of the remaining number in the North Central states. Their distribution in the several divisions is shown in Table 3.

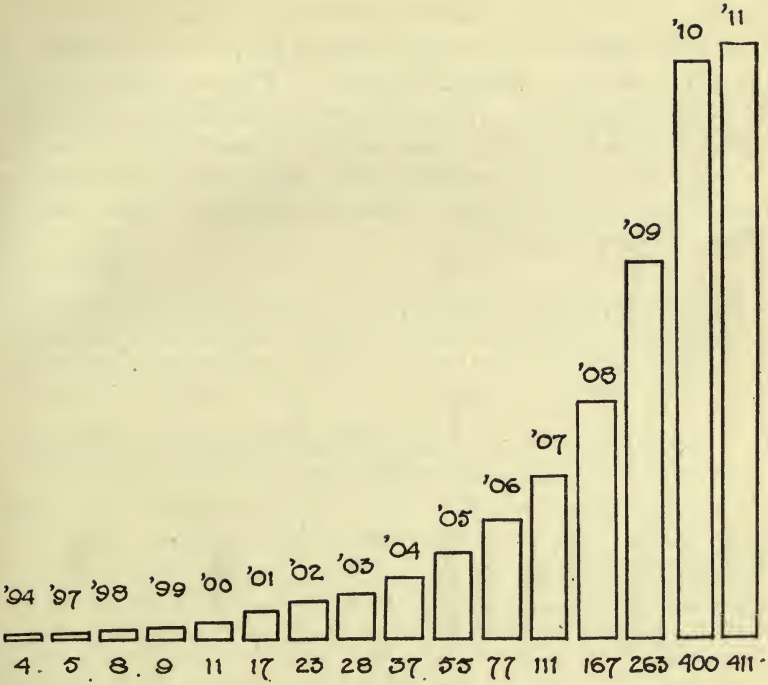


DIAGRAM I.—CITIES OF UNITED STATES HAVING SYSTEMS OF MEDICAL INSPECTION IN EACH YEAR FROM 1894 TO 1911.

TABLE 3.—CITIES OF UNITED STATES HAVING SYSTEMS OF MEDICAL INSPECTION, CITIES EMPLOYING SCHOOL PHYSICIANS, AND NUMBER OF PHYSICIANS EMPLOYED, BY GROUPS OF STATES. 1911

Division	*Cities having systems of medical inspection*	*Cities employing school physicians*	*Number of physicians employed*
North Atlantic	236	215	852
South Atlantic	23	14	48
South Central	35	27	41
North Central	109	70	417
Western	40	28	57
United States	443	354	1,415

School Nurses

The school nurse is now almost universally admitted to be one of the most necessary adjuncts of a well developed system of medical inspection. The total number employed in American cities in 1911 according to the returns of the same investigation was 415, of whom 375, or 90 per cent, were in the North Atlantic and North Central states. Their distribution in the different divisions was as follows:

TABLE 4.—CITIES OF UNITED STATES HAVING SYSTEMS OF MEDICAL INSPECTION, CITIES EMPLOYING SCHOOL NURSES, AND NUMBER OF NURSES EMPLOYED, BY GROUPS OF STATES. 1911

Division	*Cities having systems of medical inspection*	*Cities employing school nurses*	*Number of nurses employed*
North Atlantic	236	52	261
South Atlantic	23	5	11
South Central	35	4	5
North Central	109	28	114
Western	40	13	24
United States	443	102	415

Dental Inspection

Increasing attention is being paid in American schools to the inspection of children's teeth, and the work is being more and more commonly carried on as a branch of medical inspection in a semi-independent way. In a number of the large cities the local dental associations have established clinics at which school children are given treatment either gratis or at small expense. In most of these cases dentists serve without remuneration, but in a few cities they have been added as regularly paid members of the corps of medical inspectors. Sixty-nine cities had dental inspection conducted by dentists in 1911, and of these, 54, or 78 per cent, were in the North Atlantic and North Central states. Their distribution by divisions was:

TABLE 5.—CITIES OF UNITED STATES HAVING SYSTEMS OF MEDICAL INSPECTION, AND CITIES EMPLOYING SCHOOL DENTISTS, BY GROUPS OF STATES. 1911

Division	*Cities having systems of medical inspection*	*Cities employing school dentists*
North Atlantic	236	24
South Atlantic	23	8
South Central	35	3
North Central	109	30
Western	40	4
United States	443	69

Four Principal Features of Medical Inspection

Systems of medical inspection in different parts of the United States vary from simple and rudimentary ones to the more complex organizations designed to safeguard every phase of the child's physical life in the school. There are four principal features which constitute component parts of these different systems, and they are found in almost every possible combination. These features are:

1. Medical inspection conducted by physicians for the detection and exclusion of cases of contagious diseases;
2. Examinations conducted by teachers for the detection of defects of vision and hearing;
3. Examinations conducted by physicians for the detection of defects of vision and hearing;
4. Complete physical examinations conducted by physicians.

The figures showing how these different features are combined in the systems of medical inspection in this country reveal the relatively chaotic condition and lack of uniformity existing in this branch of educational work. These conditions are shown in Table 6.

The data that have been reviewed show that 443 school systems out of the 1,046 which reported had regularly organized systems of medical inspection in 1911. But these data fall far short of doing justice to the situation in the United States. While

it is true that only 443 systems, or about 42 per cent of all, had regularly organized work, 722 systems, or nearly 69 per cent, were carrying on some sort of medical inspection.

TABLE 6.—STATUS OF MEDICAL INSPECTION IN 1,046 MUNICIPAL SCHOOL SYSTEMS IN THE UNITED STATES. 1911. (THE X'S INDICATE FEATURES INCLUDED.)

Inspection for contagious disease	*Vision and hearing tests by teachers*	*Vision and hearing tests by physicians*	*Physical examinations by physicians*	*Number of school systems having the features specified*
..	x	..	..	277
x	x	..	..	92
x	..	x	x	80
x	x	x	x	65
x	x	..	x	52
x	x	x	..	43
x	..	..	..	37
x	..	x	..	32
..	x	x	..	16
..	..	x	..	11
..	..	x	x	7
..	x	x	x	4
x	..	..	x	3
..	x	..	x	3
Total				722
Systems not having medical inspection of any kind				324
Grand total				1,046

SUMMARY.—Medical inspection is provided for by law in something less than half of the American states. Regularly organized systems of medical inspection are in force in something less than half of the American cities, while a beginning has been made in nearly three-fourths of them. About four-fifths of the 443 cities having systems of medical inspection employ school physicians, almost a quarter of them employ school nurses, and in about one city in seven school dentists are employed.

Vaccination inspection in New York City.

CHAPTER III

INSPECTION FOR THE DETECTION OF CONTAGIOUS DISEASES

NEARLY all American systems of medical inspection have had for their object at the time of their inception merely the detection of cases of contagious diseases in their early stages. To this simple aim have always soon after been added the detection and exclusion of parasitic diseases.

In towns and small cities medical inspection of this sort is a comparatively elementary matter involving few difficulties in organization or administration. In such places the teacher who thinks she sees suspicious symptoms in one of her pupils, and fears they may portend the beginning of some illness, notifies the principal of her fears. He notifies the school physician by telephone or messenger and the physician comes to the school and examines the pupil, sending him home if necessary. In addition, provision is frequently made, as in the Massachusetts law, that the school authorities shall refer to the school physician for examination and diagnosis every child returning to school after absence on account of illness or unknown cause.

BLANKS AND FORMS

Such simple systems as those outlined require little in the shape of blanks or forms. Notification cards or blanks are used for informing the parents of the exclusion of the child, and weekly or monthly reports are made out by the school physician stating how many children he has examined, how many he has excluded, and for what diseases, and what other diseases he has found which did not require exclusion. A good example of such an exclusion card is the one used in Brockton, Massachusetts.

EXCLUSION CARD, BROCKTON, MASSACHUSETTS

Commonwealth of Massachusetts.

CONTAGIOUS DISEASE.

NOTICE TO PARENT OR GUARDIAN.

In accordance with Chapter 502 *of the Acts of* 1906, *you are hereby notified that* .....
has been examined by me as School Physician, and found to have symptoms of.....

This child is excluded from the schools until he brings a statement from a regular practitioner certifying his complete recovery.

..... *School Physician.*

....190

The monthly report of the medical inspector of the same city is also a good specimen of forms which have given satisfaction in simple systems, and which might well be adapted for use in any locality where the number of cases handled is comparatively small and the pupils are individually known to the school authorities so that it is easy to keep track of them.

Large systems require somewhat more complicated organization and records. Efficiency and economy of labor demand that printed forms be provided wherever their use obviates the necessity for any considerable amount of writing. The same consideration demands that on these forms underlining or checking of printed words be used wherever possible, instead of the filling in of blank spaces. The object is to attain the desired results with a minimum of clerical work consistent with efficiency. This is particularly important when the clerical work is to be performed by a high-priced man, as in the case of a high-class physician.

Let us consider a case where the school physician has examined a child and found him to have unmistakable symptoms

Medical Inspection of Schools.

Monthly Report of Medical Inspector.

.....*School* *For the Month Ending*.....190

	NO. EXAMINED.				CAUSE OF EXCLUSION.												OTHER DISEASES.							
DATE.	MALES.	FEMALES.	TOTAL.	Total Number Excluded	Measles.	Diphtheria.	Scarlet Fever.	Small Pox.	Whooping Cough.	Mumps.	Contagious Eye Diseases.	Vermin.	Ring-Worm.	Chicken Pox.	Syphilis.	Skin Diseases.	Suppurative Ear Diseases.	Adenoids.	Non-Contagious Ear Diseases.	Nervous Diseases.	Non-Contagious Eye Diseases.	Deformities.	Laryngitis. Pharyngitis.		
TOTAL.																									

Remarks or Suggestions:

BOARD OF EDUCATION.
BROCKTON, MASS.

Medical Inspector.

of a contagious disease. It is necessary that the office system enable him to dispose of the case so as to notify fully every one concerned. This requires (1) an exclusion notice to be sent to the parents; (2) a record for the school authorities; (3) a record for the board of health; (4) a record for the physician himself.

The record for the board of health and the exclusion notice require, in addition to the name of the child and the disease, the name and address of the parent.

Under many systems these notices are made out on four separate cards or sheets, and often the work is still further increased by having a separate card for the record of exclusions from each room in the school. This makes it necessary to secure the appropriate card before the record can be made. Under such conditions the physician spends five or six times as much time in making entries on different cards as he does in inspecting the child.

A large part of this waste of time and money can be obviated by a carefully planned system of records. In the case in point, for example, the work can be greatly reduced by adopting a system similar to the one in use in Chicago. Instead of being furnished with supplies of cards for making the several records, each inspector is given a book similar in size and shape to an ordinary check book. The leaves of the book are alternately of light and heavy paper perforated for separation, and have stubs like the leaves of a check book. The thin leaves and stubs are printed as shown on page 25.

The heavy sheet underneath this thin leaf is an exact duplicate, except that in the lower left hand corner instead of the words "Hand to pupil excluded" it has the words "Mail this card to Chief Medical Inspector same day pupil is excluded." Between the two leaves a sheet of copying carbon is inserted.

When an exclusion case is found the method of procedure is simple. The inspector fills out the blank and its stub. The original blank is the exclusion notice and is taken home by the pupil. The stub is handed to the school authorities as their record of the case. The carbon copy on the heavy sheet is torn out to be sent to the board of health as their notification of the case, and the stub of the carbon copy is left in the book as the inspector's record.

EXCLUSION NOTICE WITH DETACHABLE STUB, CHICAGO

MEDICAL INSPECTION OF SCHOOLS

RECORD OF EXCLUSION

Date .....19....

School.....

Pupil .....

Address .....

Cause of Exclusion:

.....

.....

Readmitted .....19.....

CITY OF CHICAGO, DEPARTMENT OF HEALTH

MEDICAL INSPECTION OF SCHOOLS

.....19.....

School .....

Name of Pupil.....

Home Address.....Ward.....

The above named pupil is hereby ordered to discontinue attendance at school temporarily for the following reasons:

.....

.....

.....M.D.

(Hand to Pupil Excluded) Medical Inspector

Under the system in use until recently in Chicago the inspector enclosed all the carbon copies of the exclusion notices in an envelope and forwarded it to the board of health. This envelope, besides being the holder for the exclusion notices, was the daily report of the inspector. On its face were blanks to be filled out as follows:

ENVELOPE DAILY REPORT OF MEDICAL INSPECTOR IN WHICH ARE FORWARDED TO BOARD OF HEALTH COPIES OF EXCLUSION NOTICES. CHICAGO

CITY OF CHICAGO, DEPARTMENT OF HEALTH

MEDICAL INSPECTION OF SCHOOLS

Inspector's Daily Report of Number of Examinations and Exclusions

I have this day examined.....(NUMBER)pupils at the.....School, made.....(NUMBER) cultures for bacterial examination, performed.....(NUMBER)vaccinations, and excluded.....(NUMBER)pupils from attendance at school for reasons stated on the enclosed exclusion cards.

Date.....19 ....M.D.

Medical Inspector

(Place the exclusion cards in this holder, enclose whole in special envelope and mail to Chief Medical Inspector. Report must be made EVERY SCHOOL DAY whether inspection has or has not been made.)

The saving effected by this system is plainly seen by comparing the number of forms necessary under the separate card method with the number required by the "check book and carbon copy" method:

Chicago Method	Separate Card Method
1. Notice and stub	1. Notice to parents
2. Envelope daily report	2. Record for school
	3. Record for board of health
	4. Record for inspector
	5. Daily report

Case of chicken-pox discovered in a class room in New York City.

Case of mumps discovered in a class room in New York City.

This system has been described at length because the principle underlying it is fundamental. If medical inspectors are to do efficient work they must not be overburdened with complex clerical work. The aim in every case must be the smallest possible number of original entries.

One commendable time-saving device which has been adopted in some cities is that of having cards for different uses in different colors so that the medical inspector can put his hand on the card he wants without a moment's delay. Utica and Syracuse, New York, have adopted this plan. Thus, in Utica the physical record card is white; the notice to parents of physical defects, salmon colored; the exclusion card, buff; the card of directions for ridding the hair of vermin, printed in English, is pink; in Italian, cherry color. The room record of pupils excluded and re-admitted is lavender.

In a number of cities it has been found necessary to have some of the cards that go to parents printed in several different languages.

One feature which nearly all American systems of medical inspection have in common is the plan of supplying printed directions for ridding the hair of vermin. One of the best of these is that followed in Everett, Massachusetts, where the pupil is not only instructed as to treatment, but is furnished with a druggist's prescription for the material required. This plan is adopted not only for cases of pediculosis (lice), but for other common complaints, such as impetigo contagiosa, ringworm, and scabies. The forms used are reproduced on pages 28 and 29.

CO-OPERATION OF THE TEACHER

Experience has demonstrated that the highest efficiency in medical inspection can be secured only through the constant co-operation of the teachers. In the matter of detecting cases of contagious disease, the best results are secured by a compromise between the system of relying entirely upon the teacher for detecting symptoms of disease and that of insisting that the physician alone shall make the inspection. It is the verdict of experience that three general propositions hold true:

PEDICULOSIS
(LICE)

DIRECTIONS: Saturate the hair with crude petroleum. Keep it wet for three hours. Then wash the whole head with hot water and soap. Repeat this process on three successive days. Then comb the hair with a fine-toothed comb wet with vinegar. To make the treatment easier and more thorough, have the hair cut short before beginning treatment. While under treatment keep away from the fire or a lighted lamp.

TO BE FILLED AT A DRUG STORE

℞

Crude Petroleum 6 ozs.

M. Sig. Apply to the hair as directed.

IMPETIGO CONTAGIOSA

DIRECTIONS: Wash the affected parts with warm water and soap. Apply the ointment morning and night until the disease has disappeared.

TO BE FILLED AT A DRUG STORE

℞

Resorcin .15
White Precipitate .50
Adipis q. s. 15.

M. Sig. Apply a. m. and p. m. until disease is cured.

RINGWORM DIRECTIONS: Remove the scales with soap and warm water. Dry thoroughly and apply the medicine morning and night until disease is cured.	TO BE FILLED AT A DRUG STORE ℞ Tincture of Iodine 10. Alcohol 20. M. Sig. Apply once a day until disease has disappeared.

SCABIES (ITCH) DIRECTIONS: Take a bath with warm water and soap, scrubbing oneself thoroughly. Then dry the skin by vigorous friction and rub into every diseased spot the ointment the prescription calls for. Continue the treatment daily until disease is cured.	TO BE FILLED AT A DRUG STORE ℞ Sulphur 7.50 Beta Naphthol 7.50 Adipis q. s. 90. M. Sig. Apply as directed.

1. It is impracticable to have the physician inspect all the pupils every day.

2. He should see them all sometimes. (In some systems such routine inspections of all pupils are made once in two weeks, in others once a month, and in still others once a term.)

3. Where school nurses are employed the problem largely disappears, as the teacher and nurse together readily decide which pupils should go to the inspector.

In localities where systems have been carefully worked out, teachers are provided with printed instructions as to the symptoms which they should notice and on account of which children should be referred to the school physicians. Probably the most carefully worked out set of such instructions is given in a pamphlet issued by the Massachusetts state board of education. This little book, which so well fills the need that it has been reprinted for use in many other localities as a good example of what such a manual should be, is reprinted in its entirety in this volume.* Under the heading "Some General Symptoms of Disease in Children which Teachers should Notice, and on Account of which the Children should be Referred to School Physician" it gives explanatory directions under each of the following headings:

Emaciation
Pallor
Puffiness of the face
Shortness of breath
Swellings in the neck
General lassitude and other evidences of sickness
Flushing of the face
Eruptions of any sort
Cold in the head with running eyes
Irritating discharge from the nose
Evidence of a sore throat
Coughs
Vomiting
Frequent requests to go out

EXCLUSIONS

In most cities examinations are made for the following diseases: scarlet fever, diphtheria, measles, small-pox, chicken-pox, tonsilitis, pediculosis, ringworm, impetigo contagiosa, trachoma, and other transmissible diseases of the skin, scalp, and eye. Tu-

* See Appendix I, p. 183.

No exclusion for ringworm when cases are treated by the nurse at school.

First aid for small ailments in Toledo, Ohio.

berculosis, when thought to be far enough advanced to be a menace to public health, is generally reported to the chief medical inspector before the pupil is excluded from school.

In general, the procedure with respect to the more common contagious diseases is substantially as follows:

Scarlet fever cases are not allowed to return to school until all desquamation is completed and there is an entire absence of discharge from the ears, nose, throat, or suppurating glands, and the child and premises are disinfected.

Diphtheria cases are excluded until two throat cultures made on two consecutive days show absence of the Klebs-Loeffler bacilli. Those exposed to diphtheria are excluded one week from last exposure.

Measles cases are excluded for three weeks or longer if there is present bronchitis, inflammation of the throat or nose, or abscess of the ear. Those exposed to measles are excluded two weeks from the date of last exposure.

Whooping cough cases are excluded until after spasmodic stage of the cough—usually about eight weeks. Those exposed to whooping cough are excluded two weeks after the date of the last exposure.

Mumps cases are excluded for ten days after all swelling has subsided.

Chicken-pox cases are excluded until the scabs are all off and the skin smooth.

Cases of tonsilitis are excluded on clinical evidence alone and throat cultures are made for future diagnosis.

In making throat examinations wooden tongue depressors are used to the exclusion of all other tongue depressors. Each tongue depressor is used only once and then burned. Aseptic methods are employed in all examinations.

When children are excluded sufficient reasons are written briefly on an exclusion card which is sent to the parents. One copy is filed with the school authorities and one with the board of health. School physicians are forbidden to make any suggestions as to treatment and management of sick pupils. This rule is nearly universal and is made imperative.

Children recovering from measles, whooping cough, mumps, chicken-pox, scarlet fever, diphtheria, and small-pox are not allowed to re-enter the school without a permit from the department

of health. If they have been taken sick with any of these infectious diseases in the school room, the pupils of the room are dismissed and the room disinfected.

In the accompanying tables figures are presented showing the number of exclusions for each of the more important diseases in four cities. In Table 7 the figures are the original data taken from the latest available reports. In Table 8 the figures are relative, showing the number of exclusions for each disease among each thousand children excluded. They indicate the variations which are encountered in this work. These variations exist not only between cities but between different years in the same city, and are mostly due to the fluctuations caused by local epidemics. The commonest disorder, and the one causing the largest number of exclusions, is pediculosis.

TABLE 7.—EXCLUSIONS FOR CONTAGIOUS DISEASES IN FOUR CITIES

Cause of exclusion	Exclusions			
	Chicago 1910	*Detroit 1909–10*	*Newark 1910–11*	*New York 1911*
Pediculosis	1,455	426	925	1,475
Tonsilitis	2,957	170	337	..
Chicken-pox	1,010	90	217	1,347
Mumps	1,128	33	135	1,475
Impetigo	986	520	..	227
Measles	1,004	84	167	414
Conjunctivitis	672	..	..	1,137
Scabies	579	254	115	215
Diphtheria	708	7	28	848
Ringworm	494	116	162	138
Whooping cough	298	108	83	329
Scarlet fever	579	19	27	198
Other causes	2,783	948	1,925	351
Total	14,653	2,775	4,121	8,154

Further data showing the great variations between cities in the matter of exclusions are presented in Table 9, which compares the number of exclusions with the total school membership in eight cities. The figures for exclusions are taken

TABLE 8.—EXCLUSIONS FOR CONTAGIOUS DISEASES IN FOUR CITIES: RELATIVE FIGURES ON THE BASIS OF 1,000 EXCLUSIONS IN EACH CITY

Cause of exclusion	Exclusions			
	Chicago 1910	*Detroit 1909–10*	*Newark 1910–11*	*New York 1911*
Pediculosis	99	154	224	181
Tonsilitis	202	61	82	..
Chicken-pox	69	32	53	165
Mumps	77	12	33	181
Impetigo	67	187	..	28
Measles	68	30	41	51
Conjunctivitis	46	..	..	140
Scabies	40	92	28	26
Diphtheria	48	2	7	104
Ringworm	34	42	39	17
Whooping cough	20	39	20	40
Scarlet fever	40	7	6	24
Other causes	190	342	467	43
Total	1,000	1,000	1,000	1,000

TABLE 9.—SCHOOL MEMBERSHIP, EXCLUSIONS FOR CONTAGIOUS DISEASE, AND NUMBER OF EXCLUSIONS PER THOUSAND PUPILS ENROLLED, FOR EIGHT CITIES

City and year	*School membership*	Exclusions for contagious disease	
		Number	*Number per thousand pupils*
Chicago, 1910	301,172	14,653	49
Cincinnati, 1910	47,454	1,606	34
Cleveland, 1908–09	69,764	1,798	26
Detroit, 1909–10	57,996	2,775	48
Newark, 1909–10	57,742	4,955	86
New York, 1909–10	744,148	8,884	12
Philadelphia, 1910	174,441	6,794	39
Rochester, 1910	26,664	1,050	39

from the annual reports as indicated in the table, whereas the figures for school membership are those given in the report of the United States commissioner of education for the corresponding years, showing the total number of different pupils enrolled in the day schools. The figures in the third column show the number of exclusions per thousand children enrolled. The significant feature is that exclusions range all the way from 12 per thousand in New York to 86 per thousand in Newark.

SUMMARY.—In order to render inspection for the detection of contagious disease effective, the most important feature to be striven after is the reduction of the machinery of administration in order that the school physicians may devote the largest possible amount of time and energy to actual inspection, and the smallest to merely clerical details.

Experience demonstrates that it is impracticable to have the physicians inspect all the pupils every day, and it is equally clear that complete inspection should be made occasionally.

Where the work is done successfully and adequately the number of cases of contagious disease among the children is greatly reduced, and the necessity for closing schools because of epidemics is largely done away with. Exclusions on account of contagious disease during the school year vary from about one in 100 to one in 10 of the school membership. The lower figure is approached only when school nurses are a part of the permanent corps of the school medical department.

CHAPTER IV

PHYSICAL EXAMINATIONS

THE theory on which physical examinations are based rests on a different foundation from that underlying medical inspection for the detection of contagious diseases. The latter is primarily a protective measure and looks mainly to the immediate safeguarding of the health of the community. The former aims at securing physical soundness and vitality and looks far into the future.

Physical examinations have come into existence because of the mass of evidence showing conclusively that a large percentage of school children—probably from one-tenth to one-fourth—suffer from defective vision to the extent of requiring an oculist's care if they are to do their work properly, and if permanent injury to their eyes is to be avoided.

These conclusions are based on examinations of hundreds of thousands of children in all parts of the world. There is little doubt as to the substantial accuracy of the results. More than this, a considerable percentage of school children are so seriously defective in hearing that their school work suffers severely. Most important of all, *only a small minority of these defects of sight and hearing are discovered by teachers or known to them, to the parents, or to the children themselves*. When children attempt to do their school work while suffering from these defects, among the results may be counted permanent injury to the eyes, severe injury to the nervous system due to eye strain, and depression and discouragement, owing to inability to hear and see clearly.

Moreover, there are other defects, in particular those of nose, throat, and teeth, which are common among children and which have an important bearing upon their present health and future development. The importance of these defects is emphasized by the fact that, if discovered early enough, they may easily be

remedied or modified, whereas neglect leads, almost without fail, to permanent impairment of physical condition.

In America, comprehensive systems embracing thorough physical examinations of all pupils are still far from general. The investigation conducted by the Russell Sage Foundation in the spring of 1911 showed that while 443* cities reported systems of medical inspection, in only 214, or a little less than half, did the work include complete physical examinations conducted by school physicians. Moreover, the cities having physical examinations were mostly in the North Atlantic division, where the work is oldest and most highly developed.†

The accompanying table presents figures showing the number of cities in each division which include in their medical inspection systems full physical examinations for the detection of defects. In this table the states are classified by divisions according to the basis adopted by the United States Census.

TABLE 10.—CITIES OF THE UNITED STATES HAVING EXAMINATIONS FOR THE DETECTION OF PHYSICAL DEFECTS, BY GROUPS OF STATES. 1911

Division	*Number of Cities*
North Atlantic	135
South Atlantic	10
South Central	12
North Central	38
Western	19
United States	214

When these figures are compared with those giving the entire number of cities which have systems of medical inspection,* they show that the cities having physical examinations are more than half of all in the North Atlantic states, less than half of all in the South Atlantic and Western ones, and only about one-third of those in the South Central and North Central groups.

* See p. 15.

† Divisions adopted by the U. S. Census. See p. 14.

Listening for trouble. Testing heart and lungs in New York City.

CONDUCT AND RESULTS OF EXAMINATIONS

Examinations for the detection of physical defects are usually conducted after the school physician has made his regular morning inspection for the detection of contagious diseases. The examinations are made in the physician's special room, which should be at least 20 feet long in order to allow sufficient space for the vision tests. In the older school buildings, where special rooms are not provided, the hallways are frequently utilized as unsatisfactory substitutes.

The children are brought into the room in groups of three or four, and in making the examination the physician usually begins at the child's head and proceeds downward over the body. The object of the examination is to detect such physical conditions as interfere with the child's health and vitality or militate against his receiving the full benefit of the education furnished by the state. This means that the examinations are purely practical in intent and hence they should avoid unnecessary refinement. For example, it is futile for the physician to record history as to height and weight unless some real end is to be attained from the study of these data. Again, it is generally useless to make records of physical defects so unimportant that, although their existence can be detected, they do not require attention from the physician, oculist, or dentist.

The defects which are looked for, and which should be recorded, are defects of teeth, throat, eyes, nose, glands, ears, nutrition, lungs, heart, nervous system, and bodily structure.

The records of physical examinations show that from one-half to two-thirds of all the children examined are suffering from physical defects sufficiently serious to require the attention of the physician, the oculist, and the dentist. The most important kinds of defects which go to make up these large totals are those of teeth, throat, eyes, and nose. Indeed, these four combined constitute more than four-fifths of all the defects found. Table 11, on the following page, presents the data showing the results of physical examinations among more than half a million children in nine American cities. The significance of these data is more clearly shown by referring to Table 12, which presents the same

TABLE 11.—RESULTS OF PHYSICAL EXAMINATIONS OF SCHOOL CHILDREN IN NINE CITIES

City and year	Children examined	Number of children having defects of							Total defects	Children having defects
		Teeth	Throat	Eyes	Nose	Glands	Ears	Other		
Boston, Mass., 1912 [a]	82,224	33,575	18,567	..	6,734	10,192	..	14,542	83,610	53,503
Chicago, Ill., 1910	120,301	43,922	24,286	19,380	9,734	16,639	2,124	10,762	126,847	53,868
Cleveland, O., 1910–11	50,864	16,464	7,776	10,709	5,936	5,010	1,496	3,795	51,186	31,787
Newark, N. J., 1910–11	24,310	7,124	4,588	3,003	2,996	4,147	396	3,332	25,586	14,954
New York, N. Y., 1911	230,243	135,843	34,639	24,514	27,319	..	1,491	10,543	234,349	166,368
Oakland, Cal., 1910–11	16,015	7,705	5,734	3,933	2,892	1,431	1,421	481	23,597	12,534
Pasadena, Cal., 1909–10	4,036	1,230	240	685	202	..	117	243	2,717	1,872
Rochester, N. Y., 1910	15,157	6,784	4,452	1,285	2,638	1,281	628	2,590	19,658	14,004
St. Louis, Mo., 1910–11	16,713	8,688	2,955	2,023	808	..	130	210	14,814	11,233
Total	559,863	261,335	103,237	65,532	59,259	38,700	7,803	46,498	582,364	360,123

[a] Partial data.

TABLE 12.—RESULTS OF PHYSICAL EXAMINATIONS OF SCHOOL CHILDREN IN NINE CITIES: RELATIVE FIGURES ON BASIS OF EACH 1,000 CHILDREN EXAMINED IN EACH CITY

	Children examined	Number of children having defects of							Total defects	Children having defects
		Teeth	Throat	Eyes	Nose	Glands	Ears	Other		
Boston, Mass., 1912	1,000	408	226	..	82	124	..	177	1,017	651
Chicago, Ill., 1910	1,000	365	202	161	81	138	18	89	1,054	448
Cleveland, O., 1910–11	1,000	324	153	211	116	98	29	75	1,006	625
Newark, N. J., 1910–11	1,000	293	189	124	123	171	16	137	1,052	615
New York, N. Y., 1911	1,000	590	150	106	119	..	7	46	1,018	722
Oakland, Cal., 1910–11	1,000	481	358	246	181	89	89	30	1,473	783
Pasadena, Cal., 1909–10	1,000	305	59	170	50	..	29	60	673	463
Rochester, N. Y., 1910	1,000	448	294	85	174	85	41	170	1,297	924
St. Louis, Mo., 1910–11	1,000	520	177	121	48	..	8	12	886	672
Average	1,000	415	201	153	108	118	30	88	1,053	656

material reduced to relative form so as to show the conditions among each thousand children examined in each of the cities.

While the comparison is interesting and instructive, the tables do not give an entirely accurate comparative view of conditions existing among the school children of the different cities. School physicians have varying standards for recording the different defects. Moreover, there is lack of uniformity in nomenclature. In the present case adenoids have been included with defective nasal breathing under nose defects, and hypertrophied tonsils have been included under throat defects. Again, figures for defects of vision and hearing are lacking for Boston, because in that city the examination for these defects is conducted by the teachers instead of by the physicians, and further blanks in the table are caused by the fact that New York, Pasadena, and St. Louis do not report cases of enlarged cervical glands.

Bearing in mind these considerations, we are still safe in interpreting the table as showing that the school physicians find about 65 per cent of the children in our public schools to be suffering from physical defects serious enough to require attention; that the most common are those of teeth, throat, eyes, and nose; and that these four classes of defects combined constitute about 85 per cent of all those discovered.

Under the caption "other defects" are included many abnormal physical conditions varying greatly in importance. Some idea of the variety and proportion of these latter may be gained from Table 13, which shows the number and per cent of physical defects found by the school physicians in the schools of New York during the calendar year 1911.

The publication of tables similar to those given here has resulted in many misapprehensions on the part of the public and those specially interested in the public schools. It has been repeatedly stated that results of physical examinations proved that two-thirds or three-fourths of all our children are physically defective, and such statements have aroused much discussion and called forth some denials. The difficulty is one of words rather than of facts. To use the word "defective" as it has been used in these cases is to give it a new and somewhat strained

meaning. What the figures really show is that a large proportion of the children are found to have defects serious enough to need recording and to require attention from a physician, dentist, or oculist. Nevertheless, the defect so recorded is frequently nothing more serious than one or more carious teeth.

TABLE 13.—RESULTS OF PHYSICAL EXAMINATIONS OF SCHOOL CHILDREN, NEW YORK, N. Y., 1911

	Number	*Per cent of all children examined*
Children examined	230,243	100
Needing treatment	166,368	72.3
Having:		
Defective teeth	135,843	59.0
Hypertrophied tonsils	34,639	15.0
Defective nasal breathing	27,319	11.9
Defective vision	24,514	10.6
Malnutrition	5,845	2.5
Cardiac disease	1,661	.7
Defective hearing	1,491	.6
Orthopedic defects	1,190	.5
Chorea	861	.4
Pulmonary disease	483	.2
Tuberculous lymph nodes	418	.2
Defective palates	85	..

It must be remembered, too, in this connection that the perfect human animal is exceedingly rare. The figures do not mean that our schools are filled with physical wrecks. They do mean that the results of examinations prove beyond doubt the need for finding out the facts and taking steps to have the defects remedied. Experience with the publication of results of medical inspection demonstrates no less clearly the imperative need for moderation of statement in making the results public.

Frequency of Examinations

American practice differs from that in vogue abroad in providing, as a rule, for the physical examination of each child annually instead of at less frequent intervals. In Germany a

Strong boys must have straight backs.

Looking for obstructed nasal breathing in a New York City school.

child is examined upon his entrance into the public school, and re-examined in the third, fifth, and eighth school years. The memorandum of the English board of education provides for four examinations during the child's school life,—upon entrance, and re-examination in the third and sixth years and upon leaving. To the date of its last report in 1911, however, the board had required in its code of regulations for public elementary schools only two examinations, one of "entrants" and one of prospective "leavers," although the known intention of the board ultimately to demand the inspection of a third intermediate group had been anticipated in 1910 by some hundred local authorities. In America the ideal of annual examinations, almost universally held, is even reflected in several of the state laws.

Unfortunately, this ideal has far outrun accomplishment and in few instances has any American city succeeded in examining all of its children in any one year. In the accompanying table figures are presented showing the number of pupils enrolled in the day schools of nine cities and the number and per cent of children who received physical examinations in the same cities.

TABLE 14.—ENROLLMENT IN DAY SCHOOLS AND NUMBER AND PER CENT OF PUPILS EXAMINED IN NINE CITIES

City and year of examination	*Pupils enrolled in day schools 1909–10*	Pupils examined for physical defects	
		Number	*Per cent*
Boston—1912 [a]	111,632	82,224	73.7
Chicago—1910	301,172	120,301	39.9
Cleveland—1910–11	74,438	50,864	68.3
Newark—1910–11	57,742	24,310	42.1
New York—1911	744,148	230,243	30.9
Oakland—1910–11	16,780 [b]	16,015	95.4
Pasadena—1909–10	5,622	4,036	71.8
Rochester—1910	26,664	15,157	56.8
St. Louis—1910–11	87,931	20,591	23.4

[a] Partial data.

[b] Figures for 1908–09.

The percentages given, though indicative in a rough way of the proportions of the field covered in the several cities, should not be taken too seriously. Thus, in view of the impossibility of

securing uniform figures in regard to enrollment for the years during which the examinations were made, it was found necessary to fall back on the report of the United States commissioner of education for 1909–10. The figures in the first column of the table, which were taken from this report, are unsatisfactory not only because they are of too early a date but because they include (presumably) the membership of high schools, which, so far as known, no one of the nine cities attempts to cover.

The situation in the cities showing respectively the highest and the lowest percentages—Oakland and St. Louis—requires a word of special comment. The enrollment figures for Oakland are by exception for the year 1908–09, while those for children examined are for 1910–11, a fact which may in part explain the very high percentage of examinations in this city. A greater effort was made in Oakland than elsewhere, however, to examine every child in the primary and grammar grades, if we may judge from the following statement made by the director of health development and sanitation:

> "All pupils present were examined during the first term, and after the Christmas vacation the schools were gone over again to get the new scholars and those missed at the first examination. A few who were absent at both examinations, or who have entered since the last, are not recorded."

In St. Louis the efforts of the department of school hygiene are chiefly concentrated on 19 schools in the more densely populated quarters of the city, practically every pupil attending which is examined, while only a small number of children from other schools are inspected when specially referred by their teachers to the school physicians.

In general, the figures indicate that five out of the nine cities examined more than half of their school children. Of Boston it should be said that the investigation was still in progress at the date when the figures given were reported, and that it was the intention to continue it till the entire school population was covered. The follow-up system in this city seems, however, to be less highly developed than that in New York and other cities which show a far lower percentage of children examined.

It should be remembered that in general these data represent unusually good conditions rather than typical ones. It would be difficult to find many other cities with equally good records of accomplishment. The lesson to be drawn from this situation is that municipalities should aim at an ideal that is possible of attainment. It would be far better to plan to examine each child once every second year and succeed in doing so than to attempt to do the entire work every year and fail. It would also be far better to examine children in alternate years and employ vigorous measures to secure correction of defects than to examine every year and merely notify parents of the need of treatment.

Time and Cost*

Physical examinations of the sort commonly given in the better American systems require from three to ten minutes each, depending on the skill of the examiner, the thoroughness of the examinations, and the condition of the pupils. Perhaps a fair average is 10 examinations per hour. This will not be reached in the poverty-stricken sections of our great cities, where the children are invariably of a low average of physical condition, and will be exceeded in the more prosperous districts, where the children are much more nearly normal.

Although 10 examinations per hour is a fair average on which to base calculations, it must be remembered that one examiner should not be expected to do this work much more than two or three hours per day. This means a limit of from 20 to 30 examinations per physician per day. From these figures an estimate of per capita cost may be reached. How much this will amount to will depend not only on the rate of remuneration of the physicians, but to a considerable degree on the character of clerical help afforded him for recording the results of his examinations.

Probably the best plan, making for increased efficiency as well as economy, is to have the school nurse or the room teacher record the results of the examinations. In the latter case a substitute must of course be placed in charge of the teacher's room during her absence. There is a distinct advantage in thus enlisting the active sympathy and assistance of the room teacher.

* For full discussion of this subject see Chap. VIII, p. 101 ff.

TESTS OF VISION AND HEARING

There are some differences of opinion and practice as to the manner of conducting tests of vision and hearing. Probably in a majority of cities which conduct physical examinations these tests are made by the school physicians. There are many localities, however, in which they are conducted by the class room teacher. The laws and regulations of 11 states provide for physical examinations, and in seven cases provision, either mandatory or permissive, is made for vision and hearing tests by teachers.

There can be little doubt that this practice has grown to such large proportions mainly through the influence of the Massachusetts statute of 1906, which required each teacher to test the sight and hearing of her pupils at least once a year and to report the results. This statute is still in force. The policy of the Massachusetts legislators in making mandatory tests by teachers, rather than tests by specialists, has evoked many expressions of surprise and some of criticism. However, the record of the debates which took place before the passage of the law shows that these provisions were inserted on the recommendation of the specialists themselves, who deemed that such tests were wholly within the capacity of the teacher. It was their opinion that the children, if examined by the teacher, would be subjected to less nervous strain than if tested by a stranger and would, therefore, respond to the tests in a more natural way. It is the intention of the Massachusetts law that a scientific examination by a specialist shall be made in any case where defects are apparently revealed by the teacher's test.

During the hearings before the state committee on ways and means, when the Massachusetts medical inspection bill was being considered, a mass of evidence was presented by experts bearing upon the question as to whether or not such examinations could be successfully conducted by teachers. The high standing of the three gentlemen who subscribed to it makes the following opinion* particularly significant:

* Massachusetts Civic League, Leaflet No. 7, p. 38.

It is the opinion of the undersigned, based upon professional experience, that school teachers, with the aid of printed directions properly prepared, are, because of their acquaintance with the individual children under their charge and their consequent ability to communicate with them and to find out what is in their mind, more capable of making a satisfactory examination of the hearing of such children than a doctor other than a specialist called in for the purpose would be likely to be.

(Signed) Clarence John Blake, M.D.
D. Harold Walker, M.D.
William F. Knowles, M.D.

The same opinion was expressed by other experts in regard to eyesight.

The methods used in Massachusetts have proved so satisfactory after several years of statewide use, that the rules for testing are here quoted in full as a guide for the conduct of such examinations.

Sight and Hearing Tests in Massachusetts

Vision and hearing tests are made in accordance with the following directions prescribed by the state board of health. The materials for the tests are distributed to all teachers by the state authorities.

COMMONWEALTH OF MASSACHUSETTS

Chapter 502, Acts of 1906
Directions for Testing Sight and Hearing
(Prepared by State Board of Health)

To Test the Eyesight

Hang the Snellen test letters* in a good, clear light (side light preferred), on a level with the head. Place the child 20 feet from the letters, one eye being covered with a card held firmly against the nose, without pressing on the covered eye, and have him read aloud, from left to right, the smallest letters he can see on the card. Make a record of the result. Children who have not learned their letters, obviously, cannot be given this eyesight test until after they have learned them.

To Record the Acuteness of Eyesight

There is a number over each line of test letters, which shows the distance in feet at which these letters should be read

* See p. 49.

by a normal eye. From top to bottom, the lines on the card are numbered respectively 50, 40, 30 and 20. At a distance of 20 feet the average normal eye should read the letters on the 20 foot line, and if this is done correctly, or with a mistake of one or two letters, the vision may be noted as $\frac{20}{20}$, or normal. In this fraction the numerator is the distance in feet at which the letters are read, and the denominator is the number over the smallest line of letters read. If the smallest letters which can be read are on the 30 foot line, the vision will be noted as $\frac{20}{30}$; if the letters on the 40 foot line are the smallest that can be read, the record will be $\frac{20}{40}$; if the letters on the 50 foot line are the smallest that can be read, the record will be $\frac{20}{50}$.

If the child cannot see the largest letters, the 50 foot line, have him approach slowly until a distance is found where they can be seen. If 5 feet is the greatest distance at which they can be read, the record will be $\frac{5}{50}$ ($\frac{1}{10}$ of normal).

Test the second eye, the first being covered with the card, and note the result, as before. With the second eye have the child read the letters from right to left, to avoid memorizing. To prevent reading from memory, a hole 1½ inches square may be cut in a piece of cardboard, which may be held against the test letters, so as to show only one letter at a time, and may be moved about so as to show the letters in irregular order. A mistake of two letters on the 20 or the 30 foot lines, and of one letter on the 40 or 50 foot lines, may be allowed.

Whenever it is found that the child has less than normal sight, $\frac{20}{20}$, in either eye, that the eyes or eyelids are habitually red and inflamed, or that there is a complaint of pain in the eyes or head after reading, the teacher will send a notice to the parent or guardian of the child, as required by law, that the child's eyes need medical attention.

Method of Testing Hearing

If it is possible, one person should make the examinations for an entire school, in order to insure an even method. The person selected should be one possessed of normal hearing, and preferably one who is acquainted with all the children, the announcement of an examination often tending to inspire fear.

The examinations should be conducted in a room not less than 25 or 30 feet long, and situated in as quiet a place as possible. The floor should be marked off with parallel lines

Vision tests by physician and nurse in Orange, N. J.

one foot apart. The child should sit in a revolving chair on the first space.

The examination should be made with the whispered or spoken voice; the child should repeat what he hears, and the distance at which words can be heard distinctly should be noted.

The examiner should attempt to form standards by testing persons of normal hearing at normal distances. In a still room the standard whisper can be heard easily at 25 feet, the whisper of a low voice can be heard from 35 to 45 feet, and of a loud voice from 45 to 60 feet.

The two ears should be tested separately.

The test words should consist of numbers, 1 to 100, and short sentences. It is best that but one pupil at a time be allowed in the room, to avoid imitation.

For the purpose of acquiring more definite information concerning the acuteness of hearing, one may have recourse to the 512 v. s. (vibrations per second) tuning fork and the Politzer acoumeter.

For very young children a fair idea of the hearing may be obtained by picking out the backward or inattentive pupils, and those that seem to watch the teachers' lips, placing them with their backs to the examiner, and asking them to perform some unusual movement of the hand, or other act.

The sight test card used is the familiar Snellen chart. A reproduction of the form used by the Massachusetts authorities is shown on page 49. In 1910 "in view of the known variations in practice both in recording and in reporting, and in the hope that the tests may be made and reported uniformly" the state board of education issued the following supplementary directions, prepared by the board of health:

1. The test will be made as early in the school year as possible, preferably in September.

2. The tests will be made under the most favorable conditions, and as nearly as possible under the same conditions, preferably in well-lighted rooms, in the early part of the day.

3. The testing will be done by the teacher of the class, and will be supervised by the principal to see that the conditions of the test are as uniform as possible for the different classes.

4. Children wearing glasses will be tested *with the glasses*, and if found normal will be so recorded.

5. Examine all children, but record as defective only those whose vision is 20/40 or less, in either eye.

6. Report to the State Board of Education the whole number of children examined and the number found defective according to the standard given in No. 5.

The results of the examinations are recorded by the room teacher on double sheets, with spaces for recording the results of the examination of 50 pupils. A reproduction of the sheet heading is given on page 50.

A report of the results for each school is forwarded to the superintendent by the teacher or principal.

REPORT OF SIGHT AND HEARING TESTS TO SUPERINTENDENTS OF SCHOOLS, MASSACHUSETTS

The Commonwealth of Massachusetts

Chap. 502, Acts of 1906

Report on Sight and Hearing Tests to Superintendent of Schools

City or Town } ..... School, ...
..... 19

Number of pupils enrolled in the school.....
" found defective in eyesight .....
" found defective in hearing.....
" of parents or guardians notified.....

.....
Teacher or Principal.

In addition to these reports the teacher is required to notify the parent or guardian of each child found to have some trouble with the ears or eyes. Notification cards like the one represented on page 50 are furnished by the state board of education.

The methods described for making tests of vision and hearing in Massachusetts are typical of the best practice in other states. The practicability of having these tests made by teachers has been abundantly demonstrated by extensive experience, and in many localities this work has been the opening wedge for the establishment of complete systems of medical inspection.

According to the investigation, tests of vision and hearing were in 1911 established features in the schools of 552 municipalities. Moreover, 349 of these cities had begun the work without legal requirement, for they are located in states which had not made legal provision for these tests. The distribution of the 552 municipalities and of 258 others in which vision and hearing tests are made by physicians is as follows:

TABLE 15.—VISION AND HEARING TESTS CONDUCTED BY PHYSICIANS AND TEACHERS IN AMERICAN CITIES, BY GROUPS OF STATES. 1911

Division	*Tests by physicians*	*Tests by teachers*
North Atlantic	125	261
South Atlantic	12	29
South Central	23	43
North Central	73	182
Western	25	37
United States	258	552

Data are available giving the results of vision and hearing tests in Massachusetts for the years 1907–10 inclusive. Similar data for Connecticut and Maine for the years 1908 and 1911 respectively are also matters of record. In brief summary form, results from these three states are as shown in Table 16.

The figures for Massachusetts show a constant and somewhat rapid falling off in the percentage of children reported each year as having defective vision and hearing. Just what has caused this falling off is difficult to determine, and indeed, has not been satisfactorily explained by the educational authorities of the state. Whatever the cause may be, the more important lesson of the table

is that in all these states the examinations result in the discovery each year of many thousands of pupils with defective vision and hearing. This means that each year large numbers of these children receive treatment for defects which otherwise would in all probability have continued uncared for and would have constantly grown more serious.

TABLE 16.—RESULTS OF VISION AND HEARING TESTS IN MASSACHUSETTS, CONNECTICUT, AND MAINE

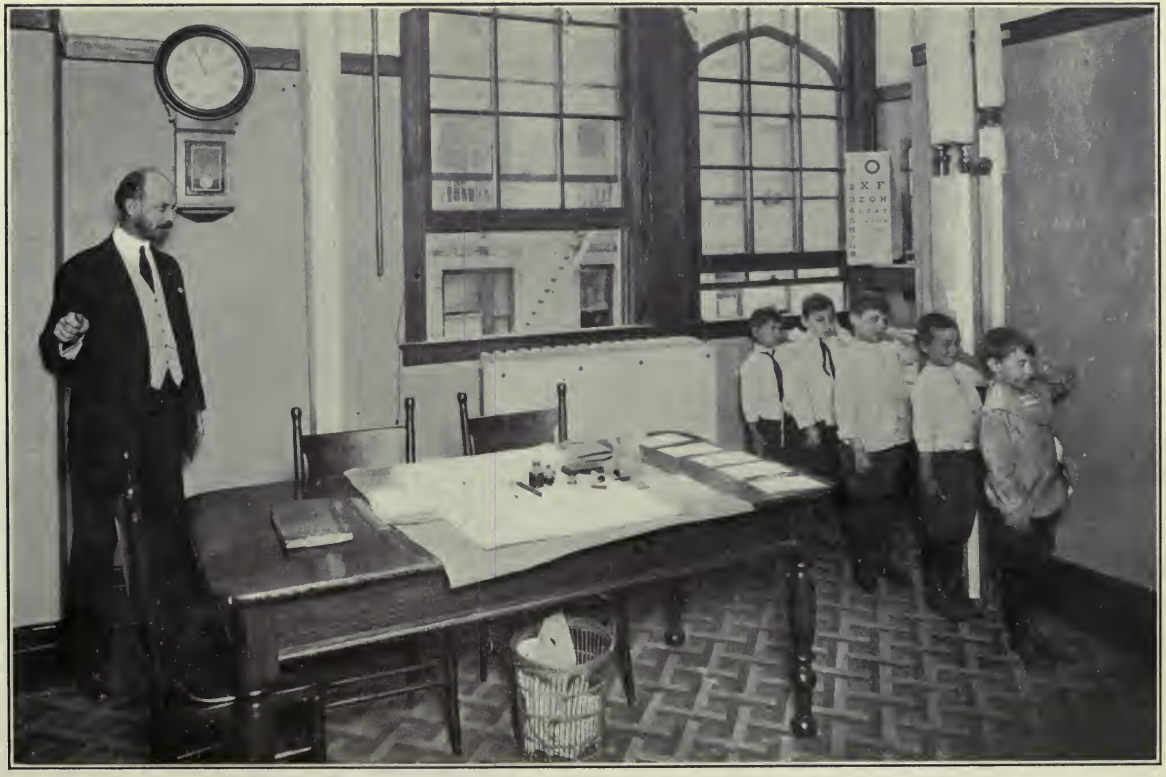
State and year	*Pupils examined*	Number of pupils		Per cent of pupils	
		Defective in vision	*Defective in hearing*	*Defective in vision*	*Defective in hearing*
Massachusetts:					
1907 . . .	432,464	96,607	27,387	22.3	6.3
1908 . . .	437,435	81,158	22,601	18.6	5.2
1909 . . .	441,463	73,129	20,167	16.6	4.6
1910 . . .	454,058	71,902	17,329	15.8	3.8
Connecticut, 1908 .	142,554	12,217	..	8.6	..
Maine, 1911 . .	87,954	11,145	4,075	12.7	4.6

RECORDS

Individual records are a most important feature of a system of physical examinations. General information about the health of the pupils as a whole will not do; there must be a complete individual record for each child. The record card or blank must have spaces for entering the results of subsequent examinations as well as the initial one. If the work is to be of real practical value, there must be the closest connection between the records of the physical examinations and those of the class room.

Three classes of forms are essential. In the first place, there must be a system for notifying the parent of the results of the physical examination of the child. Forms of this sort are considered in Chapter VI entitled, Making Medical Inspection Effective.* In the second place, there is the individual record for each child. To be effective, this record must be an integral part of the child's educational accounting and must be always available,

* See p. 72 ff.



Testing the hearing of five boys at one time in a New York City school. Not so good as one at a time, but sometimes necessary.

constantly kept up to date, and frequently referred to as an aid in reaching decisions affecting the child's welfare. It does no good to have a record on a card filed away in the principal's office or in the office of the board of health, to the effect that Willie is stone deaf in the right ear, if the teacher knows nothing of his defect and still has Willie seated in the back left-hand corner of the room. Moreover, the records must follow the child from room to room and, in case of transfer, from school to school, for otherwise much of the information obtained is soon rendered useless.

These are some of the reasons why systems for conducting physical examinations constitute entirely different problems from systems of medical inspection which aim only at the detection of cases of contagious disease. The latter sort of work can quite satisfactorily be handled by representatives of the board of health, while systems for conducting physical examinations, if they are permanently to succeed, must have the active co-operation of the educational authorities.

Few cities have developed record systems which satisfactorily fulfill the requirements outlined above. A fairly well devised card for keeping the individual record of physical examinations is that in use in the Chicago schools. It is reproduced on page 54. This card measures 4 x 6 inches and has spaces which provide for eight annual examinations. On the reverse side are spaces for "diagnosis" and "treatment received" with dates.

A somewhat more complete record is the one kept in the public schools of Pasadena, California. This card, shown on page 55, has the added advantage of providing spaces for the recording of data by the teacher as well as by the physician. This feature insures the intimate interest of the class room teacher in the work and in the records. The reverse of the Pasadena card has spaces designed to record the dates of physical examinations, and the dates and results of visits made by the school nurse to the pupil's home.

A still more complete record is called for by the card used in Berkeley, California, which provides on its face for the data of the physical examinations, and on its reverse has spaces for keeping the scholarship record. This card, face and reverse, is given on pages 56 and 57.

DEPARTMENT OF HEALTH—CITY OF CHICAGO

NAME

ADDRESS

PHYSICAL RECORD

SEX AGE BIRTHPLACE

NATIONALITY OF FATHER MOTHER

NO. OF CHILDREN IN FAMILY HIS. OF MEASLES

DIPH. PERTUSSIS PNEU. SCARLET FEVER

SCHOOL VACCINATED?

DATE 1ST EXAM. 19

O PLACED IN SQUARE MEANS ABSENCE OF DEFECTS. X DENOTES DEFECTS

1 GRADE	1	2	3	4	5	6	7	8
2 YEARS IN SCHOOL								
3 REVACCINATION								
4 DISEASES DURING YEAR								
5 DATE OF PHYS. EXAM.								
6 HEIGHT								
7 WEIGHT								
8 NUTRITION								
9 ANEMIA								
10 ENLARGED GLANDS								
11 GOITRE								
12 NERVOUS DISEASES								
13 CARDIAC DISEASE								
14 PULMONARY "								
15 SKIN "								
16 DEFECT ORTHOPÆDIC								
17 RACHITIC TYPE								
18 DEFECT OF VISION								
19 OTHER DISEASES OF EYE								
20 DEFECT OF HEARING								
21 DISCHARGING EAR								
22 DEFECT OF NASAL BREATHING								
23 DEFECT OF PALATE								
24 " " TEETH								
25 HYPERTROPHIED TONSILS								
26 ADENOIDS								
27 MENTALITY								
28 CONDUCT								
29 EFFORT								
30 PROFICIENCY								
31 WAS TREATM'T ADVISED								

Department of Health and Development, Pasadena Public Schools

SCHOOL — HISTORY OF RHEUMATISM — SCARLATINA — MEASLES

PUPIL — PARENT — PERTUSSIS — DIPHTHERIA — PNEUMONIA

ADDRESS — DATE OF BIRTH — ENTERED

GRADE AND DATE	Ex.	R	Ex.	R	Ex.	R	Ex.	R	Ex.	R	Ex.	R	Ex.	R	Ex.	R	Ex.	R
Examination and Result																		
Eyes																		
Ears																		
Nose																		
Throat																		
Neck Glands																		
Nervous System																		
Orthopedic Defect																		
Teeth																		
Heart																		
Nutrition																		
Special																		
To be Answered by Teacher: Physical Activity																		
Mental Activity																		
Conduct																		
Attention																		
Attendance																		
Vitality																		
Age																		
Height																		
Weight																		

Teacher's Name

DEPARTMENT OF SCHOOL HYGIENE

CITY SCHOOLS OF BERKELEY

Physical Record

HEALTH RECORD OF SEX: M.-F. BORN:

ADDRESS History of Rheumatism Measles Scarlatina

Diphtheria Varicella Pertussis Pneumonia Mumps Grippe

SCHOOL YEAR	1		2		3		4		5		6		7		8		9	
EXAMINATION AND RESULTS	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R	E	R
DATES																		
General Appearance																		
Nutrition																		
Flat Foot																		
Eyes																		
Ears																		
Nose																		
Throat																		
Teeth																		
Skin																		
Heart																		
Lungs																		
Neck Glands																		
Vaccination																		
Visits of Nurse																		
Relief Requests																		

NOTE

†=Normal. C.=Corrected. E=Examination
—=Not normal. N.=Not corrected. R=Result.
P. C.=Partially corrected.

REMARKS

For details see other side.

DEPARTMENT OF SCHOOL HYGIENE

CITY SCHOOLS OF BERKELEY

Scholarship Record

NAME	DATE OF BIRTH	PLACE OF BIRTH	PARENT	PARENT'S OCCUPATION
ADDRESS	ADDRESS	ADDRESS	Date of Leaving School	Father's Nationality
1	4	7		
2	5	8	Cause of Leaving School	Mother's Nationality
3	6	9		

SCHOOL YEAR	FIRST TERM						SECOND TERM					
	SCHOOL	Grade	DATE ENTERED	Weeks Enrolled	Attend-ance	Schol-arship	SCHOOL	Grade	DATE ENTERED	Weeks Enrolled	Attend-ance	Schol-arship

For details see other side

Reference has been made to the three types of records which must be kept: the first is the card of notification to the parents, the second is the individual physical record, the third is the blank on which the school physician periodically records the numbers and results of the physical examinations made by him. This third form is in nature a recapitulation of the individual records and must be designed so that the results of large numbers of individual records may be combined on it and presented in report form.

Records of Combinations of Defects

Reference to the tables which have been presented, giving the results of physical examinations,* shows that the total number of defects reported is considerably in excess of the number of defective children found. This is because one child frequently suffers from several sorts of defects.

For example, the child who has seriously hypertrophied tonsils commonly suffers from adenoids, and when he has both of these defects to a marked degree, he almost certainly has in addition seriously defective teeth. Plainly, the value of the records would be greatly enhanced if there were some method for recording not only the existence of separate defects, but the combinations in which they are found. Only through making and studying such records can trustworthy conclusions be formed as to the degree to which different defects are to be rated as both causes and effects of one another.

The first requisite of a plan for recording combinations is that it be simple; and this means that it must be restricted to a few of the more important defects. The reason for this is that the number of possible combinations increases with enormous rapidity with each increase in the number of defects considered. Thus, if we are considering two defects, A and B, there are four possible combinations. First, the child may have neither defect; second, he may have A; third, he may have B; and in the fourth place, he may have both A and B. When we consider three defects, there are eight possible combinations; and when the number is increased to four, the combinations increase to 16. Proceeding at the same

* See Tables 11 and 12, p. 38.

ratio, there are 32 possible combinations of five defects, and 64 of six defects.

These figures will suffice to support the statement that any plan for recording combinations of defects must provide for recording data pertaining only to the more important sorts of defectiveness. Fortunately, this is made possible by existing conditions. We have seen from the data presented that defects of teeth, eyes, throat, and nose constitute more than four-fifths of all the cases of physical defectiveness.

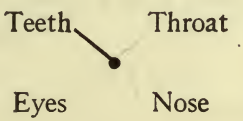
The problem, then, is to develop a system for recording the combinations of these defects. This can be done simply and easily by making provision on the individual physical record card of each child for recording the presence of any of these defects—or any combination of them—by printing the four words Teeth, Throat, Eyes, Nose, at the four corners of a square as follows:

Teeth Throat

•

Eyes Nose

If the examination shows that the child has defective teeth, the fact is recorded by drawing a line from the word "Teeth" to the dot in the middle of the square as follows:



In a similar way this device may be used to record any one of the 16 possible combinations of the four defects. These possible uses are the following:

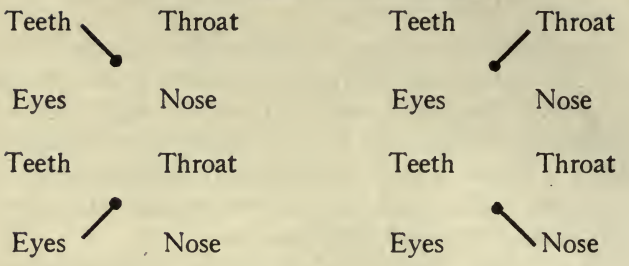
No Defect—One Possible Combination

Teeth Throat

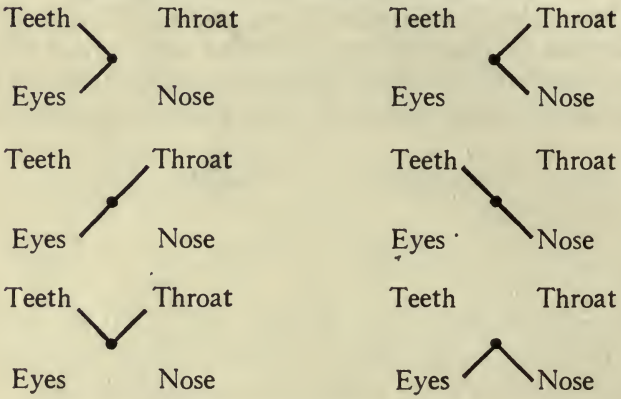
•

Eyes Nose

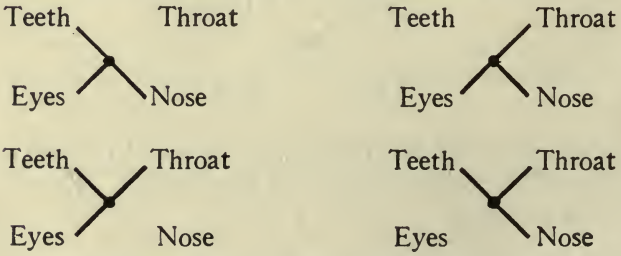
One Defect—Four Possible Combinations



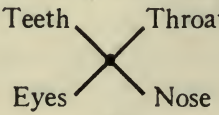
Two Defects—Six Possible Combinations



Three Defects—Four Possible Combinations



Four Defects—One Possible Combination



If the recapitulation blank on which the medical inspector reports his work by schools for a term or year is furnished with spaces for recording these combinations, the data from the individual cards can be rapidly and easily transferred. This makes it easy to bring together data for any part of the system for study and report. The scheme also has the advantage of showing automatically the number of pupils not defective and those suffering respectively from one, two, three, or four of these important defects. Moreover, by means of this scheme it is easy to discover the total number of cases of defective teeth, eyes, etc., both singly and in combinations. Most important of all, the plan furnishes valuable material for discovering causes and effects.

SUMMARY.—Physical examinations aim to insure for each child such physical and mental vitality as will best enable him to take full advantage of the free education offered by the state. There is a mass of convincing evidence showing that a large percentage of all school children suffer from remediable physical defects which can be prevented or cured if detected early in life.

In the average city school system, about 65 per cent of the children have physical defects serious enough to warrant treatment by a physician, oculist, or dentist. Nearly 85 per cent of all these defects are those of teeth, throat, eyes, and nose. Complete examinations require from three to ten minutes per child. Eleven American states have laws providing for the physical examination of school children.

CHAPTER V

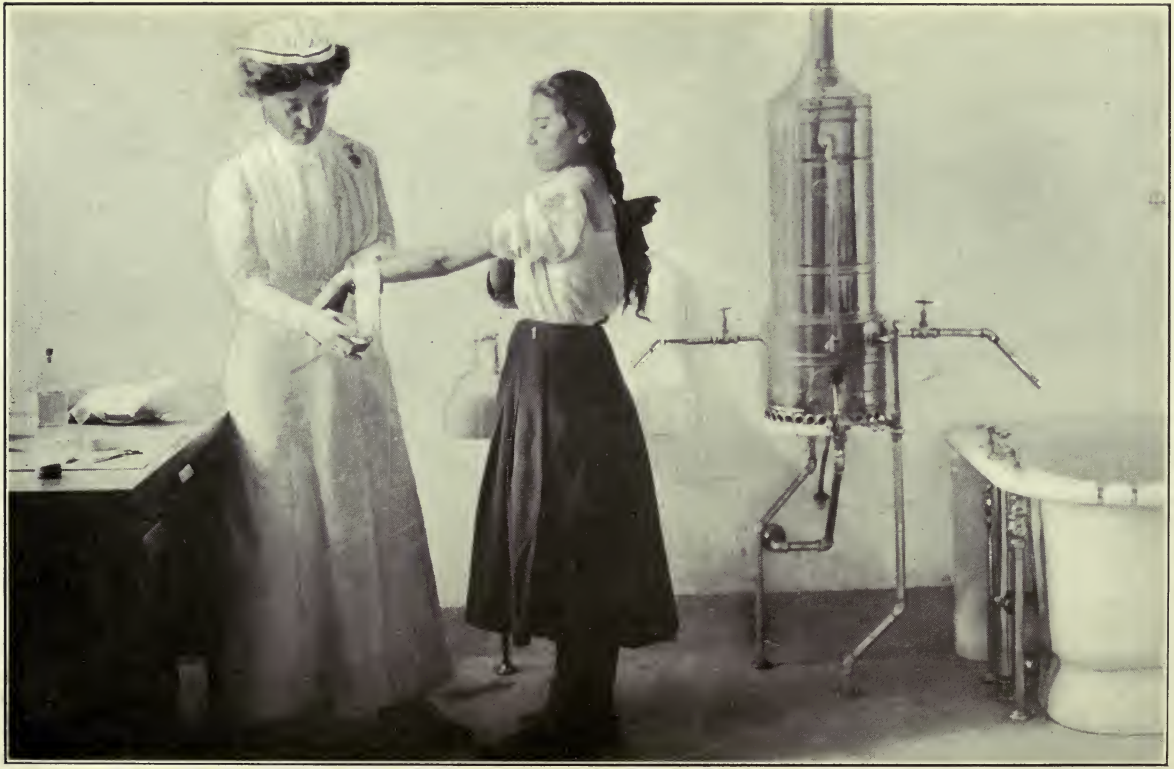
THE SCHOOL NURSE

THE value of the school nurse is the one feature of medical inspection of schools about which there is no division of opinion. Her services have abundantly demonstrated their utility, and her employment has quite passed the experimental stage. The introduction of the trained nurse into the service of education has been rapid, and few school innovations have met with such widespread support and unqualified approval.

The reason for this is that the school nurse supplies the motive force which makes medical inspection effective. The school physician's discovery of defects and diseases is of little use if the result is only the entering of the fact on the record card or the exclusion of the child from school. The notice sent to parents telling of the child's condition and advising that the family physician be consulted, represents wasted effort if the parents fail to realize the import of the notification or if there be no family physician to consult. The nurse converts these ineffective lost motions into efficient functioning by assisting the physician in his examinations, personally following up the cases to insure remedial action, and educating teachers, children, and parents in practical applied hygiene.

HISTORY AND PRESENT STATUS

School nursing had its inception in London in 1894 when the managers of a school in a very poor section asked a district nurse to visit the school to do what she could to promote the physical welfare of the children. This beginning was followed in 1898 by the formation of a volunteer "School Nurses' Society" with the object of supplying visiting nurses to elementary schools in four



School nurse in action;—first aid demonstration in Orange, N. J.

districts. Work was begun by the appointment of three nurses, each of whom had four schools under her care.

These early experiments demonstrated so conclusively the value of the nurse's services that in 1904 the system was taken over by the city and supported by municipal funds. The number of nurses was greatly increased and the work rapidly spread to other towns and cities.

From the work in London came the suggestion for a nursing staff in the schools of New York. Medical inspection had been begun in the schools of New York in 1897, and by 1902 the number of children excluded for infectious or contagious diseases had risen to alarming proportions. During the latter year there were nearly 18,000 such exclusions, and many schools were so depleted that almost half of their children were absent. This condition aroused serious protest on the part of parents and teachers.

At this juncture Lillian D. Wald, head worker of the Henry Street Nurses' Settlement, called attention to the work of the school nurses in England and offered to lend the services of one of her staff for an experimental demonstration of one month. This first American school nurse was Lina L. Rogers. As in England, so in America, it required only one demonstration to convince the public of the value of the school nurse. Her services were so valuable that the educational authorities, the board of health, and the public were at once converted to the new idea, and the movement for the employment of nurses in connection with systems of medical inspection rapidly spread to other cities. By means of work in the schools and in the home minor ailments were promptly cared for, and the number of exclusions greatly reduced.

According to the investigation conducted by the Russell Sage Foundation in 1911, there were at the beginning of that year 415 school nurses employed in 102 municipalities in the United States, and 375 of these, or 90 per cent, were in the North Atlantic or North Central states. About one-quarter of the cities having systems of medical inspection employed school nurses, and the number is rapidly increasing. Again, there was a considerable number of cities where nurses were employed, but no physicians.

THE NURSE IN AMERICAN SCHOOL SYSTEMS

Duties

The functions of the school nurse are most varied in different communities and include duties which range from the reporting of cases of truancy to diagnosing contagious diseases—two extremes, neither of which properly falls within the purview of her work. In general her duties may be concisely summarized as follows:

1. In the school:

(a) Making routine examinations of children to detect those cases which should be referred to the school physician.

(b) Assisting the physician in making physical examinations and recording results.

(c) Acting in emergency cases such as caring for accidents, bandaging cuts, removing splinters, caring for cases of fainting, convulsions, and the like.

2. In the home:

(a) Explaining to parents the significance of the notices sent by the school physicians concerning the condition of their children and aiding the parents in securing remedial action.

(b) Instructing and educating parents in the practices of applied hygiene.

3. In the clinic:

(a) Assisting the physicians in treatments and operations.

(b) Leading the children to view the proceedings of the clinic as diverting experiences rather than terrifying ordeals.

Qualifications

The history of school nursing shows its continual extension into wider and wider fields, and its constantly increasing demands for unusual qualifications on the part of the workers. In a technical sense the work is not really nursing at all, but it calls for a skill and knowledge acquired only in the training schools for nurses, and demands in addition qualifications which can at present be secured only in the school of experience.

It is a safe rule that no school nurse should be employed who is not a graduate of a training school of recognized high standing.

In addition, she should have had special experience with children, of the sort that she would gain through serving on the staff of a children's hospital.

In judging the qualifications of candidates, success in district work should be given preference over length of experience. The successful school nurse is, first of all, an intermediary between physicians, teachers, parents, and children. Permanent success requires tact above all other qualifications. No single phrase in our language adequately describes the qualification or ability referred to. It is that attribute which the Spaniards designate as the "don de gentes," which, freely translated, means the "gift of getting along with people."

Among other necessary qualifications may be mentioned activity, and ability to carry a large amount of work without worry. Any tendency to gossip should constitute sufficient cause for immediate disqualification.

Effectiveness of the Nurse's Work

Reference has been made to the value of the school nurse's work in reducing the number of exclusions on account of contagious and infectious diseases. How this operates in practice is shown by the experience of New York City before and after the organization of the corps of school nurses. In the system prevailing up to 1902 all cases of contagious and infectious diseases were excluded by the physician. If this system had continued in force the number of exclusions in 1911 would have reached a grand total of 253,738. This number is so great in proportion to the total membership of the schools that had all these children been excluded the entire school system would have been seriously disorganized. The actual number of exclusions during 1911 amounted to 8,154, or a little more than 3 per cent of the number of cases of contagious diseases. This means that in the experience of New York City, through the employment of school nurses exclusions from school had been reduced to something like one-thirtieth of their former proportions.

While a review of reports on medical inspection in American cities shows that superintendents and medical inspectors have abundantly endorsed the work of school nurses, it is only rarely

that data are found giving any sort of measure of the value of their services. Almost the only direct comparison between results accomplished with and without the co-operation of the nurses comes from the city of Philadelphia. Data bearing on the problem were presented by Dr. Samuel W. Newmayer of that city in a paper entitled Evidence that the School Nurse Pays, printed in the proceedings of the Fifth Annual Congress of the American School Hygiene Association.

The first set of data presented by Dr. Newmayer shows the number and per cent of recommendations acted upon in four schools where a nurse was at work as compared with the number acted upon in four other schools where the medical inspector was unaided by a nurse. This comparison is shown in Table 17.

TABLE 17.—RESULTS OBTAINED BY MEDICAL INSPECTORS AIDED AND NOT AIDED BY SCHOOL NURSES. EIGHT SCHOOLS, PHILADELPHIA, 1910

Results with nurse's aid				Results without nurse's aid			
School	*Recommendations*	*Recommendations acted upon*	*Per cent acted upon*	*School*	*Recommendations*	*Recommendations acted upon*	*Per cent acted upon*
A . . .	324	262	81	E . . .	283	83	29
B . . .	445	434	98	F . . .	582	152	26
C . . .	320	282	88	G . . .	441	94	21
D . . .	264	226	86	H . . .	474	91	19
Total . .	1,353	1,204	89	Total . .	1,780	420	24

A comparison of the percentage figures shows that in the four schools where the inspector was aided by a nurse 89 per cent of the recommendations were acted upon, whereas in the four other schools, where the medical inspector worked alone, only 24 per cent of the recommendations resulted in action.

Dr. Newmayer's second series of data contrasted two sets

The school nurse is the most efficient link between the school and the home.

of results with respect to four specified kinds of physical defects. The data are presented in Table 18.

TABLE 18.—RESULTS OBTAINED BY MEDICAL INSPECTORS AIDED AND NOT AIDED BY SCHOOL NURSES. PHILADELPHIA, 1910

Defect	Results with nurse's aid			Results without nurse's aid		
	Number of cases	*Cases treated*	*Per cent treated*	*Number of cases*	*Cases treated*	*Per cent treated*
Vision	441	355	80	272	70	26
Tonsils	104	68	65	338	62	18
Adenoids	62	45	73	36	5	14
Teeth	150	138	92	152	31	20
Total	757	606	80	798	168	21

A comparison of the figures in the percentage columns shows that where the inspector was aided by a nurse, 80 per cent of the cases received treatment as contrasted with only 21 per cent where he was without such aid. The investigation covered the same period of time in the two cases and the defects existed among 704 children in the school where the inspector was aided by a nurse, and among 751 children where he was not aided by a nurse.

While the comparisons presented in the foregoing tables constitute an impressive argument in favor of utilizing the services of a school nurse to increase the effectiveness of medical inspection, they must not be accepted as giving a true measure of the value of such services. We must not interpret them as meaning—as the figures would seem to show—that medical inspection with a nurse is three or four times as effective as medical inspection without a nurse. In the case of the per cent shown in the first table we are not certain as to the character of the "results" reported, and in studying both comparisons it must be borne in mind that they represent reports of special studies made with the object of demonstrating the effectiveness of the nurse's work. Nevertheless, the comparisons are of value in showing that the effectiveness of medical inspection is definitely and distinctly enhanced when the work of the school physician is supplemented by that of the school nurse.

Proportion of Nurses to Pupils

Experience in New York, Philadelphia, and other large cities has shown that in the congested districts a nurse should be provided for every 3,000 or 4,000 pupils. With this number of pupils the nurses can do effective and efficient home visiting as well as the work of routine inspection in the schools. In cities of from 20,000 to 30,000 inhabitants with a public school enrollment of 3,000 to 5,000 the services of one nurse will be found adequate, providing the schools are reasonably near together.

It must be remembered in this connection that much depends on the social status of the children. The records of medical inspection in great cities show that many sorts of physical defects vary in more or less direct proportion with the degree of poverty in the homes of the children. Among such defects are enlarged tonsils, defective nasal breathing, defective hearing, decayed teeth, skin diseases, vermin, and above all, malnutrition. In the poorer sections of cities and in quarters largely peopled with recent immigrants the prevalence of these conditions will require the appointment of more nurses if the work is to be done effectively. With conditions as they now exist in such sections of our greater cities, one nurse for each 2,000 children or even one for each 1,500 is none too many.

Rules for Nurses

The following set of rules issued by the board of education of Newark, New Jersey, embodies most of the features that characterize the best practice in connection with the rules and instructions laid down for the guidance of school nurses. With such modifications as local conditions demand, they will be found satisfactory for use in most communities.

Rule 1. Nurses shall at all times be under the direction of the Supervisor of Medical Inspection.

Rule 2. Applicants for the position of school nurse shall submit to an oral and written examination and also to a physical examination by the Supervisor of Medical Inspection. All applicants must hold a certificate of graduation from an approved training school for nurses, having a course of not less than two years.

Rule 3. The salary of each nurse shall be for the first year, $720;

second year, $780; third year, $840; fourth year, $900, the maximum; in twelve monthly payments. In addition, each nurse shall be supplied with carfare at the expense of the Board of Education and an outfit, consisting of a bag and supplies for treating her cases. These supplies shall be obtained on order from the Department of Medical Inspection.

Rule 4. Each nurse shall devote her entire time to the school work during the hours of service, which shall be from eight a. m. to twelve noon, and from one p. m. to five p. m. on all week days except Saturday, when the hours of service shall be from eight a. m. to twelve noon, and at other times if required by the Supervisor of Medical Inspection in special cases. Nurses shall report to the office of the Supervisor of Medical Inspection each morning at eight a. m. for instruction, and shall attend meetings with the Supervisor of Medical Inspection at his call. A daily report shall be made out by each nurse on forms supplied by the department and filed in the office of the Supervisor of Medical Inspection. Each nurse shall, on visiting a school, register her name, time of arrival and departure, in the attendance book in the principal's office.

Rule 5. Nurses shall perform class room inspection once a month, or oftener if directed by the Supervisor of Medical Inspection. Nurses shall refer all cases of suspected disease or defect, except pediculosis, to the medical inspector for his opinion as to what shall be done. Where contagious disease is suspected, and the doctor is not in the school, the pupil shall be excluded. The name, age, address, and school of pupil shall be reported immediately to the office of the Supervisor of Medical Inspection. All other diseases and defects which are not contagious shall be brought to the notice of the medical inspector as soon as possible.

Rule 6. The nurse shall have entire charge of all cases of pediculosis and uncleanliness.

Rule 7. The diseases to be treated by the nurse are as follows: Ringworm, scabies, favus, impetigo, molluscum contagiosum, conjunctivitis, infected wounds, contusions and uncleanliness. No case of the above diseases shall be treated by a nurse without the diagnosis being confirmed by the medical inspector of the school which the pupil attends, and whenever possible, with the parents' consent. A record shall be kept of each pupil when placed under treatment by the nurse and the dates of subsequent treatments noted on forms supplied by the Board of Education.

Rule 8. It shall be the duty of the nurse to visit the homes in special cases, for the purpose of interviewing and instructing the parents or guardians. These visits shall be made before or after school hours and on Saturdays.

Cases to be visited by the nurse at home are

(a) Flagrant cases of pediculosis. The nurse shall show the mother how to treat the conditions and encourage persistence.

(b) Excluded cases that do not return at the appointed time.

(c) The nurse shall call at the homes of any children whose parents have refused or neglected to comply with the request of the medical inspector or have not given a satisfactory reason for not doing so. At this time the nurse shall urge upon the parent the need for treatment and, if necessary, demonstrate how it shall be done.

Rule 9. Practical talks on personal hygiene and home hygiene shall be given by each nurse to the pupils at such times as the Supervisor of Medical Inspection shall specify, but not to interfere with the ordinary routine of the school.

Rule 10. Each nurse shall receive one month's vacation during the interval between the closing of the school year in June, and the reopening of the schools in September, the time of vacation to be designated and assigned by the Supervisor of Medical Inspection.

Rule 11. School nurses shall be appointed to serve for a term of one year, extending from February 1st to January 31st. In case a vacancy occurs, same shall be filled for the unexpired term only.

Salaries

The salaries of school nurses in American municipalities range from $500 to $1,500 per annum. The study made in 1911 showed that the salaries of nurses were distributed as shown in the following table:

TABLE 19.—SALARIES OF NURSES IN 106 AMERICAN MUNICIPALITIES

Salary	*Number of cities where nurses received salary indicated*
No salary	21
$201–$300	2
$401–$500	1
$501–$600	21
$601–$700	17
$701–$800	24
$801–$900	15
$901–$1000	2
$1001–$1500	2
Fees according to service	1
Total	106

The table shows that there are more cities paying their school nurses from $701 to $800 per annum than there are paying any other salary, but the average salary would be about $700 per year. Where the nurses render services without cost to the municipality their salaries are paid by some other organization, and in the cases where the salary is between $200 and $300 the payment is made in return for only a part of the nurse's time. In some cases these salary figures represent remuneration for twelve months' service, and in other cases for only nine or ten months.

It is a safe rule that no municipality should expect to secure the services of competent women of the right type for less than $75 per month. In addition, provision should be made for increases based on satisfactory services and higher salaries for those doing supervisory work.

SUMMARY.—To sum up the case for the school nurse: She is the teacher of the parents, the pupils, the teachers, and the family in applied practical hygiene. Her work prevents loss of time on the part of the pupils and vastly reduces the number of exclusions for contagious diseases. She cures minor ailments in the school and clinic and furnishes efficient aid in emergencies. She gives practical demonstrations in the home of required treatments, often discovering there the source of the trouble, which, if undiscovered, would render useless the work of the medical inspector in the school. The school nurse is the most efficient possible link between the school and the home. Her work is immensely important in its direct results and far-reaching in its indirect influences. Among foreign populations she is a very potent force for Americanization.

CHAPTER VI

MAKING MEDICAL INSPECTION EFFECTIVE

MEDICAL inspection came into being when educators awoke to a realizing sense of the intimate relationship existing between physical vigor and mental efficiency. Physical examinations have become the most important feature of medical inspection because of the great mass of data showing that a large proportion of all school children suffer from entirely remediable physical defects, the very existence of which was formerly unsuspected by the teachers, by the parents, and by the pupils themselves.

The theory underlying the conduct of physical examinations, as we have noted, has been that it is the function of the school medical department to discover these defects and bring their existence to the attention of the parents. Wherever inspection has been carried on for any considerable time, experience has demonstrated that this procedure is not sufficient. After the first interest dies down, mere notification does not suffice to secure action on the part of any large proportion of the parents. In order that the work may be effective, the cases must be followed up, the parents convinced that some action is necessary, and the community educated up to a new standard of applied hygiene.

SECURING PARENTS' CO-OPERATION

Notifications of Parents

In the simplest systems of medical inspection, parents are notified of defects discovered by means of a simple card advising that the child be taken to a physician for treatment. A typical example of such a card is the one furnished by the state board of education of Massachusetts.

NOTICE TO PARENT OR GUARDIAN, MASSACHUSETTS

Commonwealth of Massachusetts

NOTICE TO PARENT OR GUARDIAN

IN ACCORDANCE WITH CHAPTER 502 OF THE ACTS OF 1906 YOU ARE HEREBY NOTIFIED THAT

.....

HAS BEEN EXAMINED BY ME AS SCHOOL PHYSICIAN AND FOUND TO HAVE SYMPTOMS OF

PLEASE SECURE COMPETENT MEDICAL ADVICE AT ONCE

.....SCHOOL PHYSICIAN.

....19

When systems become more highly developed, it is found that the effectiveness of the work can be greatly enhanced by sending the notification on a return post card which serves the purpose of notifying the parent of the condition of his child, making a brief statement as to the importance of the case, and providing a convenient means whereby the physician consulted can report back to the school authorities what action, if any, he has taken in the case. The post card form in use in Birmingham, Alabama, shown on page 74, fulfills these three objects admirably.

Securing Parents' Consent

In many cities special forms are used on which parents give written consent to have their children treated at the school clinics or the hospitals working in co-operation with the educational authorities. A typical blank of this type is the form reproduced on page 75, which is in use in the public schools of St. Louis.

Parents Present at Examinations

In England and in Germany special care is taken to have parents present during the examination of their children in order

POST CARD NOTIFICATION FORM, BIRMINGHAM, ALABAMA

Present this Card to Physician. Series C—Form 1

BOARD OF EDUCATION
BIRMINGHAM, ALA.

.....School. Date.....191....

M.....

We have reason to believe that.....
a pupil in the school, is in need of medical attention for.....
.....We advise that you consult your family physician, or the Free Dispensary of the Hillman Hospital (open daily at 12:00 o'clock, noon).

.....M. D.
MEDICAL DIRECTOR.

.....
PRINCIPAL. (OVER)

- -

TO THE PHYSICIAN: In order to complete the record in this case, you are requested to kindly state the result of your examination and to mail this card. Please do not write the name of the child, as this card is registered by number.

The child presenting this card is found to suffer from.....
.....
.....
.....

Treatment has.....been instituted.

Date..... .....M.D.

No.....

- -

TO PARENTS:

Experience has shown that a large percentage of school children suffer from eye-strain, throat or ear disease, or other preventable defects. These disorders can be greatly relieved or prevented, if recognized early, but if allowed to persist or grow worse, may seriously impair the child's general health and mental development. Mental backwardness may be traced frequently to physical defects.

Such diseases may be readily recognized in the school room, and this recognition and prevention is the object of the Department of Medical Inspection in the schools.

Respectfully, J. H. PHILLIPS,
Superintendent.

PARENT'S CONSENT BLANK, ST. LOUIS, MISSOURI

FORM 11-Q
1911

ST. LOUIS PUBLIC SCHOOLS.
DEPARTMENT OF HYGIENE.

PARENT'S CONSENT BLANK.

St. Louis,.....

I desire and hereby authorize that my child.....

.....be taken by the school nurse to the Free Medical Clinic or Free Hospital for whatever treatment, medicinal or surgical, the Doctors in charge find necessary to improve the health of the above named child.

Respectfully,

.....

School Nurse Witness:

.....

that their sympathy and assistance may be enlisted and held. This purpose is expressed in the memorandum of the British board of education as follows:

"Nor must the influence which the parent can exercise by example and precept be neglected. One of the objects of the new legislation is to stimulate a sense of duty in matters affecting health in the homes of the people, to enlist the best services and interests of the parents,

and to educate their sense of responsibility for the personal hygiene of their children. The increased work undertaken by the state for the individual will mean that the parents have not to do less for themselves and their children, but more."

In the attainment of this purpose, the English educational authorities almost invariably attempt to have either the parent or guardian of the child present during the first examination. In 1909 the percentage of parents attending inspections varied from 13 to 90 in different localities. In more than half of these localities the parents were present during more than 50 per cent of the examinations.

Methods and results similar to those outlined are features of the German systems. Unfortunately, the plan has never been tried on any extensive scale in America and it is only recently that our educational authorities have begun to realize that true effectiveness in medical inspection is in a large measure dependent upon securing the active co-operation and interest of the parents.

Follow-Up Visits

In the chapter describing the work of the school nurse, reference has been made to the valuable services rendered by school nurses in following up cases and securing action.* Extended experience in many localities has demonstrated that by this method the percentage of pupils receiving remedial attention may be greatly increased and the effectiveness of the measures taken greatly enhanced.

It is probably safe to hazard the generalization that after systems of physical examination have been in force for some years the percentage of children receiving remedial attention where no follow-up system is employed is apt to fall to about 15, and that where there is a follow-up system and school nurses are employed to visit the homes when necessary, this percentage can be held at about 75.

Office Consultation

In many of the more efficient American systems it has been found desirable for the school physician to arrange for regular

* See Chap. V, p. 62.

Team work between physician and nurse in Toledo, Ohio.

office hours during which he can be consulted by the parents of the children. These consultations are for the purpose of furnishing advice and not for the purpose of giving treatment. They are most effective in securing the sympathetic co-operation of the parents with the work and aims of the school medical department. The forms reproduced below and on page 78, which are used in the public schools of Oakland and Pasadena, California, are good examples of cards used to notify parents of the opportunity for consulting with the school physician.

NOTIFICATION OF DEFECTS AND OF OPPORTUNITIES FOR CONSULTATION, OAKLAND, CALIFORNIA

School .....

Grade.....
Pupil's Name

.....
Parents' Names

.....
Address

.....
Remarks

.....

.....

Date.....
Teacher

.....

OFFICE OF
DEPT. OF HEALTH DEVELOPMENT AND SANITATION
OAKLAND SCHOOLS

Date.....

To the Guardian or Parent of

.....

Dear Sir:

A physical examination of this pupil seems to show an abnormal condition of the.....

.....

Kindly take the child to your family physician or specialist for advice and treatment so that .....*may be in better condition to continue*..... *studies.*

The Director will be in his office, 4th floor of the Central Bank Building, from 1:30 to 4:30 p. m., Mondays and Thursdays, to meet parents and pupils for consultation, but not for treatment.

Very respectfully,

TAKE THIS TO THE PHYSICIAN *N. K. FOSTER, Director.*

These cards serve the double purpose of notifying the parent of the defects discovered and telling him of the office hours of the school physician.

In Berkeley, California, a card* is used to inform the parent of the physician's office hours and invite him to visit the office.

In Oakland another form† is used to notify the parent that

*See p. 79.

†See p. 79.

NOTIFICATION OF DEFECTS AND OF OPPORTUNITIES FOR CONSULTATION, PASADENA, CALIFORNIA

NO._____

PASADENA PUBLIC SCHOOLS
HEALTH DEPARTMENT

_____School Date_____

On careful examination we find that_____

needs attention on account of_____

The Public Schools of Pasadena, through their health department, are looking carefully into the health condition of all the pupils who seem to need such attention. It is our desire that parents shall co-operate by seeing a physician, dentist, or other specialist as the case may require, without delay. The child's health must be good or his work will suffer. The medical examiner gives no treatment, his duty is to advise only. He will be glad to meet parents for further consultation and advice, at the office of the City Superintendent on Mondays and Fridays from 4 to 5 o'clock, provided an engagement is made for that purpose.

DR. R. C. OLMSTED,
Medical Examiner

(OVER)

The parent will kindly indicate what can be done in this case and return this card, signed, at the earliest possible time. We wish to check up the return messages within a week, if possible.

In cases where parents cannot pay the usual charges for medical or dental treatment, special arrangements will be made on consultation with the medical examiner.

(INDICATE HERE WHAT CAN BE DONE)

Signed_____
PARENT OR GUARDIAN

the school nurse has called at the home during the absence of the parent. This card includes an invitation to call at the office for consultation with the medical director.

NOTIFICATION TO PARENTS OF SCHOOL PHYSICIAN'S OFFICE HOURS

Health and Development Department
Berkeley Schools

CARD TO PARENTS

IF you will bring_____
to the office of the School Physician, in the High School Building, any Tuesday, Thursday or Friday afternoon between 2:30 and 4 o'clock, he will be very glad to give you additional information, and to advise you about obtaining medical or dental attention.

MEDICAL DIRECTOR OF SCHOOLS

NOTIFICATION OF NURSE'S CALL AND OF SCHOOL PHYSICIAN'S OFFICE HOURS, OAKLAND, CALIFORNIA

DEPARTMENT OF HEALTH DEVELOPMENT AND SANITATION
OAKLAND PUBLIC SCHOOLS

1358 Broadway,.....191..

The School Nurse failed to find you at home when she called to consult with you regarding the condition of.....
who was examined.....and reported for.....
.....
..... *We desire to work with the parents to better the health and strength of the children, and request that you either call in person or report to this office if any attention has been given the reported defect*

Very respectfully,
N. K. FOSTER, Director

Office Days
Monday and Thursday, 1:30 to 4:30 p. m.

.....*Nurse.*

COMMUNITY EDUCATION THROUGH PRINTED BULLETINS

Nearly all well developed systems have some form of printed bulletin for instructing parents as to the methods and aims of medical inspection, the importance of conditions found, and steps necessary to remedy them. Examples of such instructions with respect to the care of pediculosis are to be found in the chapter on contagious disease, while similar instructions in regard to certain phases of dental work will appear in the chapter on dental inspection.

Quite the best series of such bulletins is that prepared by Dr. Ernest Bryant Hoag of California and widely used in the cities of that state. These bulletins are in the form of two-page leaflets measuring 3½ x 5½ inches, which are designed for distribution among parents and children. They give in condensed and effective form authoritative information concerning the importance of the more common physical defects. Several of them are reproduced in Dr. Hoag's excellent little book The Health Index of Children. This method of public education is so effective and Dr. Hoag's Health Pamphlets are so admirably designed to serve their purpose that two of them are reproduced herewith. Another of the same series dealing with the teeth is reproduced in the chapter on dental inspection.

HEALTH PAMPHLET NO. 1

by

Dr. Ernest Bryant Hoag

THE RESULTS OF NOSE, THROAT AND EAR TROUBLES IN CHILDREN

An examination of school children shows that many of them suffer from nose, throat and ear troubles. Probably at least 25% of our children in the schools of the United States have such defects. Why this is so we do not know.

Parents are very likely to be unfamiliar with these conditions. Often they do not know when their own children are afflicted in this way. It is the business of the School Medical Examiner, employed by the Boards of Education or Boards of Health, to discover children who need medical attention.

No child can do his best work in school if he is suffering from some nose, throat or ear trouble. The commonest conditions found in such children are enlarged diseased tonsils, adenoids and deafness.

The tonsils are glands in the throat, one on each side of the root of the tongue. When they are in a healthy condition they are barely visible. They often become much inflamed and sometimes there is pus present in them. They may obstruct breathing.

Any child with diseased tonsils is likely to be sickly.

Any child with diseased tonsils is likely to have many attacks of sore throat, or tonsilitis.

Any child with diseased tonsils is very susceptible to contagious diseases.

Any child with diseased tonsils *Has A TENDENCY TOWARD CONSUMPTION.*

No child can be well or do his best work in school with diseased tonsils.

Diseased tonsils should usually be removed and should always be treated. The operation is not dangerous. It always improves the child's health.

Adenoids are soft spongy growths behind the soft palate, between the nose and throat. A child with adenoids usually breathes with his mouth open. He cannot breathe well through his nose. Mouth breathing is not a habit. If a child breathes with his mouth open it is because there is some obstruction in the nose.

Adenoids cause a child to sleep with his mouth open.

Adenoids often cause a child to snore.

Adenoids nearly always make the teeth come in crooked.

CROOKED AND PROMINENT TEETH ARE NEARLY ALWAYS CAUSED BY ADENOIDS.

Adenoids make a child take cold easily.

Adenoids often give a child a stupid appearance.

Adenoids often RESULT IN ACTUAL STUPIDITY, because the child cannot get enough air.

Adenoids often cause ear ache and deafness with sometimes a running ear. Catarrh, deafness, ear ache and discharge from the ear are more often due to some obstruction in the nose or throat than to anything else.

Adenoids usually result in delicate health.

Adenoids *MUST BE REMOVED* if you expect a child to be healthy or mentally bright.

It is an injustice to children to neglect caring for them when adenoids or diseased tonsils are present. It is very poor economy on the part of the parent to neglect the treatment of children so affected. Any child will grow up healthier, happier, and more useful if these conditions are taken care of.

HEALTH PAMPHLET NO. 2

by

Dr. Ernest Bryant Hoag

The Results of Defective Eye-Sight

Defects of eye-sight in school children are very common. Probably at least 20% of the children of our American schools suffer from such defects.

These defects not only cause a great deal of trouble in the eyes themselves, but often produce many other serious results, which do not at first seem to be connected with the eyes.

The proper treatment of children's eyes will nearly always bring good results. In this way they will often be saved from life-long suffering.

A child's education will not be worth much to him if he does not have good eye-sight. The ability to earn a living depends very largely upon good eye-sight. It is very poor economy to neglect to care for defects in the eyes of children, for sooner of later such children may become burdens upon some one.

The common defects in the eyes of children are as follows:

1. NEAR SIGHT

This condition is very serious. It not only limits the child's range of vision and prevents his taking part in health giving sports and recreation, but it produces changes in the eyes which often result in practical blindness.

2. FAR SIGHT

This condition is more common than near sight. It results in eye strain and often causes squinting, red eyes, headache, nervousness, backwardness in studies, and sometimes digestive disorders and poor health generally.

3. ASTIGMATISM

This is the most common of all eye defects. It results in blurred vision, headache, nervousness, and other kinds of discomfort. It may be associated with either near sight or far sight.

4. CROSS EYES OR SQUINT

This is often the result of *FAR Sight.* It is absolutely necessary to have this defect corrected. In children this can usually be done with glasses alone. If the trouble is not cured the vision of the crossed eye will become poorer and poorer *UNTIL AT LAST THIS EYE BECOMES BLIND.*

5. INFLAMED OR RED EYES

This condition is often caused by a defect in vision, but frequently it is due to *INFECTION.* That is, something has gotten into the eyes and carried *PUS-PRODUCING GERMS WITH IT.*

Serious eye disorders are sometimes "caught" from dirty towels, public bathing pools, dirty hands, or dust.

Each child and grown person should use only his own towel. Red sore eyes ought never to be neglected. Remember that many cases of sore eyes are contagious and that all such cases need the attention of a doctor.

Peculiar postures, holding the head on one side, squinting, miscalling words and headache should always raise the suspicion of possible eye trouble.

LEGAL COMPULSION

Two of the states which have framed regulations or enacted laws on medical inspection have provided for compulsory action against parents who fail to act upon notification of disease or defect in their children.

Colorado, in the law passed in 1909, provided that

"If the parents or guardian of such child [i.e., one found defective concerning whom notification of need of treatment has been sent] shall fail, neglect, or refuse to have such examination made and treatment begun within a reasonable time after such notice has been given, the said principal or superintendent shall notify the State Bureau of Child and Animal Protection of the facts . . . ."

The procedure regarding such cases is further elaborated in a circular letter of instructions to teachers and principals:

"The Physician's Report is to be returned to the Teacher. If within a reasonable time the Physician's Report is not received by the Teacher or proves to be unsatisfactory; or where in lieu thereof the parent or guardian sends a written statement that he has not the necessary funds wherewith to pay the expenses of such examination and treatment the Teacher will send a Failure Notice (with such written statement if any) to the Principal or County Superintendent, recording same on the pupil's Teacher's Record Card.

"The Principal or County Superintendent will record the Failure Notice on Pupil's Record Card and forward the Notice to the State Bureau of Child and Animal Protection, State House, Denver.

"If a written statement of inability to pay accompanies a Failure Notice, the Principal or County Superintendent will at once 'cause such examination and treatment to be made by the County Physician of the District wherein said child resides'; who if unable to treat such child shall forthwith report such fact to the County Commissioners with his recommendation. If satisfactory results are not had within a reasonable time, the Failure Notice, written statement of inability to pay, statement of reference to County Physician, etc., with other information germaine to the case is to be forwarded by the Principal or County Superintendent to the State Bureau of Child and Animal Protection.

"What constitutes a 'reasonable time' will be left to the judgment of the Teacher, under the advice and direction of the Principal or County Superintendent. If, after taking all the circumstances into consideration, doubt exists, refer the matter to the Bureau of Child and Animal Protection, with full particulars.

"Whatever unpleasant or difficult duty may arise in the enforcement of the law for the examination and care of School Children, is laid by the law, not upon the Teacher, the Principal, the County Superintendent or the State Superintendent of Public Instruction, but upon the State Bureau of Child and Animal Protection.

"Whenever the State Bureau of C. and A. P. receives a Failure Notice it will at once send its own notice to the Parent or Guardian requesting compliance with the law, and will, at the same time notify the Teacher of that action.

"In most cases a notice from the Bureau will be sufficient to induce prompt obedience to the law. If, however, they still 'fail, refuse or neglect,' the Teacher will send a second Failure Notice, marked 'No. 2,'

to the Principal or County Superintendent, who will forward it to the State Bureau of C. and A. P. at the State House, Denver.

"When the Bureau of C. & A. P. receives a Failure Notice accompanied by a written statement of inability to pay, etc., it will investigate and assist.

"When the Bureau receives a second Failure Notice it will send an officer who will first consult with the Teacher, if possible with the Principal or County Superintendent, and acting under the direction of the Bureau will take charge of the case."

Regarding action under this law, the report of the Colorado State Superintendent of Public Instruction for 1909–10 has this to say:

"Out of the 41,546 cases of defectiveness reported to the State Superintendent of Public Instruction as having been discovered, and presumably reported to the parents of the children, 221 cases were reported by teachers to the State Bureau of Child and Animal Protection for failure of parents to have the medical examination indicated by the teachers' examination made. Whether this was the total number of cases which should have been reported we have no means of knowing. In the absence of further information it may be assumed that it does not depart far from the total which should have been referred.

"With one exception the parents in all these cases were induced by letter or by the visit of our officer to do whatever the children's condition required. In the one case where it was necessary to bring the parents into court the child's throat was nearly closed by enlarged tonsils and his health seriously affected. At the trial the father was sentenced to thirty days' imprisonment."

The New Jersey law, passed also in 1909, provides as follows:

"If the cause for exclusion is such that it can be remedied, and the parent, guardian or other person having control of the child excluded as aforesaid shall fail or neglect within a reasonable time to have the cause for such exclusion removed, such parent, guardian or other person shall be proceeded against, and, upon conviction, be punishable as a disorderly person."

No record of action under this provision of the law has been found. Neither the report of the New Jersey Superintendent of Public Instruction for 1909–10 nor any of the 21 reports from county superintendents, or the 30 reports from city superintend-

ents contained in the same volume, mentions this clause of the law, though most of them contain statements regarding medical inspection. One county superintendent writes: "The weakest place in the system seems to be lack of efficient remedy when defects are discovered of a nature not infectious or contagious."

In England many fines have been imposed (some under attendance by-laws, others under a clause of the children's act) upon parents who failed to cleanse or keep clean the bodies and heads of their children. Parents who neglected and ill-treated their children have also been imprisoned or fined, another clause of the children's act being invoked in their cases. In this latter group of cases are included those of children suffering from defective eyesight, enlarged tonsils and adenoids, decayed teeth, and ulcerated mouths. Many such children were treated after the cases had been brought into court, with the result that proceedings against the parents were stopped.

SCHOOL AND HOSPITAL CLINICS

Wherever systems of medical inspection become highly developed and the authorities attempt to make the work effective, they are confronted with the problem of what to do to secure adequate treatment for children whose parents either cannot pay for it at all or can pay only a small fee. The services of the school nurse are effective in securing action on the part of many parents who would otherwise take no action whatever, but there always remain a considerable number of parents who are willing that their children should receive treatment but who are unable to meet any large expense involved.

Thus the school nurse alone cannot meet the situation and some agency must be provided to cope with the problem. In most cases this agency is a hospital, more rarely a clinic established within the school itself. In either case it is generally true at the present time in American cities that facilities are inadequate to meet the need.

In Great Britain the policy of the board of education since the adoption of the medical inspection law in 1907 has been to urge local school authorities to secure the utmost possible degree

of co-operation from existing hospitals and clinics. Where such institutions have been of high character, but limited in capacity by their small endowments, special government subsidies have in some instances been approved in order to permit the extension of their work to care for cases referred from the public schools.

Nevertheless, these measures have frequently been found inadequate, and prior to 1911 school clinics for the treatment of skin and scalp diseases and in some instances for the care of defective teeth, eyes, ears, and throats, had been established in 30 cities.

Almost the only writer on medical inspection in America who has faced the problem of inadequate treatment squarely is Dr. George J. Holmes, supervisor of medical inspection in Newark, New Jersey, whose views are outlined in the following quotations from his article published in the Journal of the Medical Society of New Jersey, 1911.

"I have suggested that free public school clinics be established to care for all diseases and defects common to school pupils. No pupil to be admitted unless attending a public school, presenting a printed slip showing that he or she has been referred for treatment by a medical inspector, and that his or her home has been visited by a school nurse, finding such poverty that free treatment is necessary and right.

"Were such a clinic established by the Board of Education and conducted by the supervisor of medical inspection and his assistants, both physicians and nurses, it would no longer be necessary for a pupil to leave school during session for treatment or examination. Pauperism would not be fostered. Such a clinic should be held from three to six p. m. daily, except Sundays.

"Other benefits resulting from school clinics would be the creating of greater interest among the physicians and nurses of the department, in their being able to follow the cases and see the results. Greater opportunity would be afforded both physicians and nurses to meet parents of the children afflicted, and opportunity for preaching and impressing the common facts relating to personal and home hygiene on the parents. Greater results would be obtained and better opportunity would be given the supervisor to observe the work of each member of the department."

It is probable that few of the educational authorities in this country would be prepared to accept so radical a proposition

as that of Dr. Holmes. So far as is known, the only strictly school clinics conducted in the United States are the dental clinics in Rochester, Cincinnati, Muskegon, Philadelphia, and Elmira, and the eye clinic in Cleveland. The time is undoubtedly at hand, however, when some solution to the pressing problem created by needy children left untreated must be sought out and applied. Frank facing of the problem is needed if medical inspection is to fulfill the hopes of its friends.

SUMMARY.—Invitations to parents to be present at examinations of children, follow-up visits by nurses, arrangements for children to attend hospitals and clinics, the establishment of office hours when medical supervisors may be consulted by parents, and the education of the community through printed bulletins explaining the nature and importance of defects, are five measures of great value in rendering medical inspection effective.

Mere notifications of defects, unsupplemented by such measures as the above, can never be expected to secure more than a small proportion of the treatments needed. The possibilities of increasing the effectiveness of medical inspection by legal measures to compel neglectful parents to take action have not yet been thoroughly tested in this country, but the working of Colorado's experiment along this line is worth study.

The presence throughout the schools of the country of large numbers of children whose parents cannot afford to pay current rates for treatment creates a problem which is pressing for solution. The suggestion that dental and medical school clinics be established to deal with this class of cases will increasingly demand the attention of school authorities who are dissatisfied with the inadequate returns secured by present systems of medical inspection.

CHAPTER VII

RESULTS

DEFINITE information as to the actual results achieved by medical inspection for the detection and correction of physical defects is exceedingly meager. Superintendents and health officers frequently state in their annual reports that the response of parents to notifications is unsatisfactory, and urge the adoption of more effective follow-up methods. Where nurses have recently been installed, satisfaction is generally expressed and the statement made that a marked increase of co-operative action has resulted. Definite statistical evidence is, however, rarely offered with regard to any phase of the problem.

The success of a system of medical inspection of schools is to be measured by the results achieved. The mere piling up of statistical data as to defects would be valueless unless action of some sort followed. In printed reports, the meaning attached to the word "results" is the crux of the whole matter. In most cases where any mention is made of results secured it takes the form of "treatments reported," "attention given," or "physician consulted." Occasionally some detail is entered into, as the number of pairs of glasses obtained or the number of operations performed. Very rarely a notation as to improvements following treatment is made.

The type of report on results which a school physician makes is naturally determined by his conception of the function of his office. On the side of results, four possible functions may be formulated:

1. To bring parents to the point of taking their children to a physician or dentist, clinic or hospital.

2. To ascertain whether the consultation is a genuine one and whether appropriate treatment has been instituted.

3. To ascertain, where no treatment or inadequate treatment only

has been given, what is the reason for such failure (i. e. parental ignorance, indifference, hostility or poverty, lack of clinical resources, etc.).

4. To ascertain the ultimate results of treatment upon the child's physical health and mental development.

The first function is inevitably the one first recognized, as it is undoubtedly the most important. The second function is almost forced upon the inspector where later contact with a child reported "under treatment" leads to the discovery that no effective measures to remedy bad conditions have been taken. It is especially important in large cities where unprincipled practitioners find it easy to connive with parents in a pretense of consultation. Yet assumption of the duties and responsibilities it implies is rare in American cities. The third function follows naturally upon the second and would call for but little additional work.

The fourth function is as yet recognized by scarcely any American community. It can be developed to its fullest possible limits only where there is active and enthusiastic co-operation of teachers and principals with medical officers. Such following up of children as it requires is far more difficult in large cities than in small towns, since transfers from school to school mean re-examinations by different inspectors, in which case comparison of "before" and "after" conditions becomes unreliable. Records of re-inspections by physicians when sufficient time has elapsed after treatment so that definite results are discoverable, and records by teachers of their observations during extended periods are, however, essential features of any scheme for testing the value to the child and to the community of medical inspection.

The report of a school physician who based his work on the assumption that all the above functions belonged to his office would be likely to contain several features not now generally found in such reports. Among them would probably be:

A statement of the number of children enrolled, the number examined, the number having specified defects and combinations of defects, and the number reported as having consulted a private physician or dentist, or as having been taken to a clinic or hospital for treatment.

A statement of the number of these children found on investigation, after a stated period following the reported consultation has elapsed,

to have received adequate treatment, the kind of treatment being specified.

A statement of sources of treatment; that is, private physicians or dentists, specialists, clinics, hospitals, etc., with number of children treated by each.

A statement of the number of children who failed to receive effective treatment, classified to show causes of failure; that is, parental neglect or opposition, poverty, lack of adequate or accessible clinics, lack of intelligent co-operation by clinics and family physicians, etc.

A statement of ultimate results on health and school standing produced by specified kinds of treatment in children suffering from each sort of defect.

Such a report would furnish a basis for the formulation of policies now generally lacking. If, for example, it revealed a large amount of parental neglect of serious conditions when adequate means of securing treatment for such conditions existed in the community, the need of a new type of educational activity directed toward the older generation would be made evident. If on the other hand there were revealed many cases where lack of facilities for medical, surgical, or dental treatment was the cause of unsatisfactory results, the problem of securing adequate facilities for treatment would be placed squarely before the educational and health authorities with its alternative of continued waste of public funds in ineffective inspection.

RECORDS OF DEFECTS TREATED IN NEW YORK CITY

New York occupies the first place in the discussion of this subject, both on account of the size of its problem and because the history of its endeavor to cope with that problem is an unusually long and instructive one. Treatments, as reported by the Division of Child Hygiene of the Department of Health for the year 1911, include all cases where report of attention received was made by physicians. Instructions in mouth hygiene by nurses, said to have been given in all cases where defective teeth were discovered, are not included. The figures undoubtedly include many cases where treatment never went beyond the initial visit to a physician. Moreover, according to the director of the Division of Child Hygiene of the Department of Health, they include cases where

physicians, without examination and for a fee of 25 cents, have furnished diagnoses agreeing with those of the medical inspectors on the slips brought them by the children. There is, however, no reason to suppose that the figures given are any less reliable than those reported from other cities. The data showing in detail the number and per cent of defects treated are presented in Table 20.

TABLE 20.—PHYSICAL DEFECTS REPORTED BY MEDICAL INSPECTORS, AND NUMBER AND PER CENT OF THESE DEFECTS TREATED. NEW YORK CITY, 1911

Defect	*Cases reported*	*Cases treated*	*Per cent treated*
Vision	24,514	16,633	68
Hearing	1,491	847	57
Nasal breathing	27,319	22,839	84
Hypertrophied tonsils	34,639	22,647	65
Tuberculous lymph nodes	418	295	71
Cardiac disease	1,661	1,286	77
Pulmonary disease	483	377	78
Chorea	861	483	56
Orthopedic	1,190	522	44
Malnutrition	5,845	3,632	62
Teeth	135,843	18,164	13
Palate	85	40	47
Total	234,349	87,765	37

In the case of four of the defects, further details are given as to the character of the remedial treatment. These details are as follows:

Defective vision:
- Treated by supplying glasses 11,304
- Receiving medical treatment 5,329

Defective nasal breathing:
- Receiving operative treatment 11,284
- Receiving medical treatment 11,555

Hypertrophied tonsils:
- Receiving operative treatment 9,808
- Receiving medical treatment 12,839

Defective teeth:
- Treated by extraction 7,373
- Treated by filling 10,791

It is interesting to note that the highest percentage of treatments was that reported in cases of defective nasal breath-

ing where over 80 per cent were treated, more than 40 per cent by operation. In nearly all other classes of defects, upwards of 50 per cent of cases were reported treated, but the very low percentage of cases of defective teeth which received attention is in striking contrast, and evidently accounts for the fact that but 37 per cent of all the defects needing attention received it.

Lack of appreciation of the need of dental care, and lack of clinics where teeth can be put in order at a moderate cost, are doubtless alike reflected in the low percentages of extractions and fillings.

REPORTS FROM OTHER CITIES

In the report of medical inspection in the schools of Newark, New Jersey, occurs the following statement showing the definite action taken on defects of vision, hypertrophied tonsils, adenoids, and defective teeth; that is, provision of glasses, operations for tonsils and adenoids, and dental treatment.

TABLE 21.—FOUR CLASSES OF PHYSICAL DEFECTS REPORTED AND NUMBER AND PER CENT OF THESE DEFECTS TREATED. NEWARK, N. J., 1910–11

Defect	*Cases reported*	*Cases treated*	*Per cent treated*
Vision	3,003	989	33
Tonsils	4,588	416	9
Adenoids	1,866	238	13
Teeth	7,124	772	11
Total	16,581	2,415	15

As the table shows, the percentage of defects receiving the specified remedial treatment was 15. The corresponding figures cited for New York City give a percentage of nearly 23. In the New York report the term "defective nasal breathing" is considered equivalent to the term "adenoids" in the Newark one. In general, the figures make it appear that Newark is somewhat behind its larger neighbor in the treatment of eyes, ears, and throats, and about on a par in the treatment of defective teeth.

Harrisburg, Pennsylvania, gives the following statement of reported treatments for the school year 1909–10:

TABLE 22.—PHYSICAL DEFECTS RECOMMENDED FOR TREATMENT AND NUMBER AND PER CENT OF THESE DEFECTS TREATED. HARRISBURG, PA., 1909–10

Defect	*Cases recommended for treatment*	*Cases reported treated*	*Per cent of recommended cases reported treated*
Malnutrition	72	24	33
Enlarged cervical glands	17	4	24
Chorea	8	4	50
Cardiac disease	8	3	38
Pulmonary disease	5	4	80
Skin disease	61	30	49
Defective vision	677	268	40
Defective hearing	143	51	36
Defective nasal breathing	204	83	41
Defective teeth	187	48	26
Deformed palate	8	2	25
Hypertrophied tonsils	805	249	31
Adenoids	432	153	35
Total	2,627	923	35

The numbers here are small, in some cases so small that the percentages are hardly worth considering. In general, it would appear that from 20 to 40 per cent of cases needing treatment received it.

In Pasadena, California, during the same year, the proportions of cases treated were not very different. The report of action taken is as follows:

TABLE 23.—PHYSICAL DEFECTS REPORTED AND NUMBER AND PER CENT OF THESE DEFECTS TREATED. PASADENA, CAL., 1909–10

Defect	*Cases reported*	*Cases treated*	*Per cent treated*
Eyes	685	242	35
Ears	117	21	18
Nose	202	69	34
Throat	240	91	38
Teeth	1,230	375	30
Nutrition	195	64	33
Nervous system	48	12	25
Total	2,717	874	32

From Summit, New Jersey, comes a report of the numbers of cases discovered, the number referred to a physician, and the cases in which a physician was consulted.

TABLE 24.—DEFECTS REPORTED, NUMBER REFERRED TO PHYSICIANS, AND PER CENT OF THESE IN WHICH PHYSICIAN WAS CONSULTED. SUMMIT, N. J., 1909–10

Defect	*Cases reported*	*Cases referred to physician*	*Cases in which physician was consulted*	*Per cent of cases referred to physician in which physician was consulted*
Defective vision	185	132	79	60
Defective hearing	21	10	8	80
Hypertrophied tonsils	124	43	12	28
Adenoids	35	18	6	33
Defective teeth	383	112	44	39
Total	748	315	149	47

The striking feature of this report is the large proportion of cases discovered which were not considered important enough to be referred for treatment. It is to be assumed that all cases regarded as needing treatment were referred. The percentage of eye and ear cases in which physicians were consulted, based upon the numbers referred, is much higher than in Harrisburg or Pasadena; but the number of cases under the head of "hearing" is so small that discussion as to their disposition is hardly worth while.

INTER-CITY COMPARISONS

The foregoing data, cited from the reports of the different cities, give a general idea of the degree to which inspection for the detection of physical defects results in remedial treatment. It must be remembered that these data are gathered from cities where the problem has been given special attention and undoubtedly reflect conditions distinctly better than the average. When the figures from four of the cities are brought together the result is as shown in the following table:

TABLE 25.—DEFECTS REPORTED AND THE NUMBER AND PER CENT OF THESE DEFECTS TREATED, IN FOUR CITIES

City and year	*Defects reported*	*Defects treated*	*Per cent treated*
New York City, 1911	234,349	87,765	37
Pasadena, Cal., 1909–10	2,717	874	32
Harrisburg, Pa., 1909–10	2,627	923	35
Summit, N. J., 1909–10	748	149	20

Several other cities report the number of children given remedial treatment, rather than the number of defects remedied. These figures reduced to percentages for three cities are as follows:

St. Louis, Mo., 1909–10 . . . . . 24 per cent
Trenton, N. J., 1909 . . . . . 39 per cent
Oakland, Cal., 1910–11 . . . . . 52 per cent

As has been noted, statements as to improvement resulting from treatment are rare. In Trenton, according to the report referred to above, 172 out of the 190 children treated were "improved." Our ignorance as to kinds of defects included, nature of treatment, and standards by which improvement was judged, makes the statement of slight value.

Treatment by Physicians and Institutions

Statements with regard to the agency from which treatment was obtained are made by two cities—New York and St. Louis. Those for New York are as follows:

TABLE 26.—CASES OF PHYSICAL DEFECTS TREATED BY PRIVATE PRACTITIONERS AND BY INSTITUTIONS, NEW YORK, 1911

Defect	*Cases treated by private practitioners*	*Cases treated by institutions*
Glasses	5,530	5,666
Operative	9,777	10,048
Medical	20,604	10,684
Physical culture	17	42
Instructions	..	341
Extraction of teeth	836	232
Filling teeth	1,222	151
Total	37,986	27,164

The St. Louis report for 1910–11 states that during that school year the number of cases treated by family physicians or dentists was 825 as compared with 1,088 cases treated at free dispensaries or clinics.

Treatment Following Examinations by Teachers

All the reports thus far cited have been of results following more or less complete physical examinations by physicians. Two Massachusetts cities, Lowell and Somerville, offer figures bearing on treatments resulting from teachers' examinations of sight and hearing. Lowell reports that of 922 cases of defective eyes and ears referred to parents in 1910, 349, or 37.8 per cent, were "professionally treated." Somerville's percentages of "professionally treated" cases during five successive years are as follows:

TABLE 27.—PERCENTAGES OF CASES OF DEFECTS OF EYES AND EARS TREATED PROFESSIONALLY. SOMERVILLE, MASS., 1906–10

Defect	1906	1907	1908	1909	1910
Eyes	25.3	14.3	24.9	13.4	10.8
Ears	20.9	12.5	10.2	12.3	12.3

It is evident that a larger proportion of cases received attention in the first year in Somerville than have ever been treated since. The result is the more difficult to explain, since the percentage of children examined who were found defective, both in eyes and ears, has steadily decreased from year to year.

Comparison of the Somerville and Lowell percentages of eye and ear treatments with the data from other cities already cited reveals the fact that Lowell's results approximate those secured in Harrisburg and Pasadena, while Somerville's are far behind. This contrast may be due to the fact that Somerville is the only one of the group which does not employ a nurse or home visitor to follow up cases needing attention.

The diverse reports made by the 10 cities mentioned in this chapter indicate that anything in the nature of a general conclusion as to the value of results achieved by medical inspection for physical defects cannot be drawn. It is, however, safe to assume that scarcely any American city has yet succeeded in securing the benefits of genuine treatment for as many as half the children needing it. While a certain irreducible minimum of defectiveness must doubtless always remain uncorrected, it seems certain that this minimum has nowhere yet been reached.

Doubtless continuing efforts for adjustment will result in the devising of new methods for meeting the need. One of the most practicable plans now being urged is that for the establishment of school dental clinics, which is discussed in another chapter.* The correction of all dental defects, which are everywhere the most common defects, would mean a long step in advance. The establishment of open air schools for tuberculous and anemic children is also a measure the effectiveness of which has been abundantly demonstrated in many cities both here and abroad.

REPORTS OF TREATMENT IN ENGLISH COMMUNITIES

Reports of treatment for physical defects are more common in England than in this country, but from the comments of the chief medical officer of the board of education it is evident that there is some uncertainty as to what is meant by the word "treatment." In his report for 1910 he states that more accurate description of results cannot be achieved "until the report on the results is based on actual re-examination by the medical officer." The medical officer should inform himself on four points:

1. Whether treatment was obtained.

2. The nature of the treatment, e. g., whether by medication,the provision of food, a visit to a convalescent home, or the performance of an operation.

3. By what agency the treatment was obtained, e. g., by parent, nurse, charitable society, private practitioner, at the hospital, or through the Poor Law.

4. The exact results of such treatment, or the causes, so far as can be ascertained, of failure to obtain treatment.

*See Chap. IX, p. 114.

Reported treatments are tabulated in 24 areas, 12 of them counties, 12 of them boroughs or urban areas. The defects and diseases reported on are: defects of vision (including in some cases squint), defects of the external eye, of tonsils and adenoids, defective hearing, ear and skin diseases. Not all of these defects are, however, reported on from every area. Report is also made from some areas regarding "uncleanliness and vermin." The figures relative to these conditions are omitted in the accompanying summary:

TABLE 28.—RECOMMENDATIONS FOR TREATMENT BY MEDICAL INSPECTORS AND NUMBER AND PER CENT OF TREATMENTS IN 24 ENGLISH AREAS. 1910

County areas	*Cases recommended for treatment*	*Cases treated*	*Per cent of recommended cases treated*
Anglesey	374	204	54.5
Devonshire	2,525	557	22.1
Ely, Isle of	257	144	56.0
Essex	3,643	1,735	47.6
Kent	6,290	2,502	39.8
Middlesex	2,481	1,169	47.1
Norfolk	1,303	692	53.1
Nottinghamshire	626	284	45.4
Surrey	1,417	688	48.6
Sussex (West)	505	358	70.9
Worcestershire	598	419	70.1
Yorks (East Riding)	312	176	56.4
Total	20,331	8,928	43.9
Borough and Urban Areas			
Beckenham	204	52	25.5
Blackburn	803	458	57.0
Darlington	608	281	46.2
Derby, C. B.	334	83	24.9
Leicester, C. B.	1,235	639	51.7
Lincoln, C. B.	133	88	66.2
Middlesborough	992	545	54.9
Morley	350	73	20.9
Penge	179	38	21.2
Salisbury	202	119	58.9
South Shields	732	420	57.4
Wolverhampton	322	148	46.0
Total	6,094	2,944	48.3

It would appear that the English communities are considerably in advance of those of the United States, as exactly 12 out of the 24 included in this summary report over half of their defects as treated, while but one American city was found which reported as high as 50 per cent of treatments.

SUMMARY.—American cities which offer statistical reports regarding defects treated are exceptional. Such reports as are offered show roughly from 11 per cent to 50 per cent of treatments, figured in some cases on a basis of number of defective children, in others on a basis of number of defects.

Reports from England are far more numerous and show a higher range of percentages treated—from 20 per cent to 70 per cent—while the average for 24 areas is about 50 per cent.

Definitions of what is meant by "treatment" are seldom given in either country, but such evidence as exists indicates that the figures published generally tend to overstate rather than to understate the proportion of cases genuinely treated.

CHAPTER VIII

PER CAPITA COSTS AND SALARIES

SINCE systems of medical inspection vary in scope from vision and hearing tests conducted by teachers to complete physical examinations conducted by physicians, and because the attendant expense may range anywhere from the slight cost of printed material supplied to teachers to high salaries paid physicians and nurses, it follows that generalizations concerning per capita costs must be somewhat indefinite.

Cost of Inspection for Contagious Disease

The sort of medical inspection which has for its object the discovery of incipient cases of contagious disease and their exclusion from school, is in reality merely an extension of the work which has been done by boards of health. It is not inherently expensive in terms of time or money. In most cities the work is carried on by having the school physicians call each day, or two or three times a week, and inspect the children referred to them by the teachers as seeming to be in ill health, or who have returned to school after an unexplained absence. In most cases, the physician comes at stated times, without being notified. In some places the less efficient method is followed of having the principal notify the physician by telephone when he is wanted. The annual per capita cost for this sort of medical inspection averages about 13 cents.

Cost of Vision and Hearing Tests Given by Teachers

By far the least expensive of all systems are those consisting solely of examinations conducted by teachers for the detection of defects of vision and hearing. They are prescribed by state law or regulation in Massachusetts, Colorado, Indiana, Maine,

Minnesota, Rhode Island, and Utah, and are conducted without legal enactment in many towns and cities of other states.

The only expenses incurred in such examinations, in addition to the cost of the teacher's time, are for printed material consisting of directions, test cards, record blanks, notices to parents, etc. Even for a large number of children, the expense is low. The amount appropriated by the Massachusetts act is $800 per year, and of this appropriation only $592 was actually expended in 1910–11. As there are approximately half a million children in the public schools of Massachusetts, this means an annual per capita expenditure of slightly more than one mill.

In Connecticut, where tests of vision are conducted triennially, the total expense for the state is about $700 for each test, which means a per capita cost of nearly one-half cent.

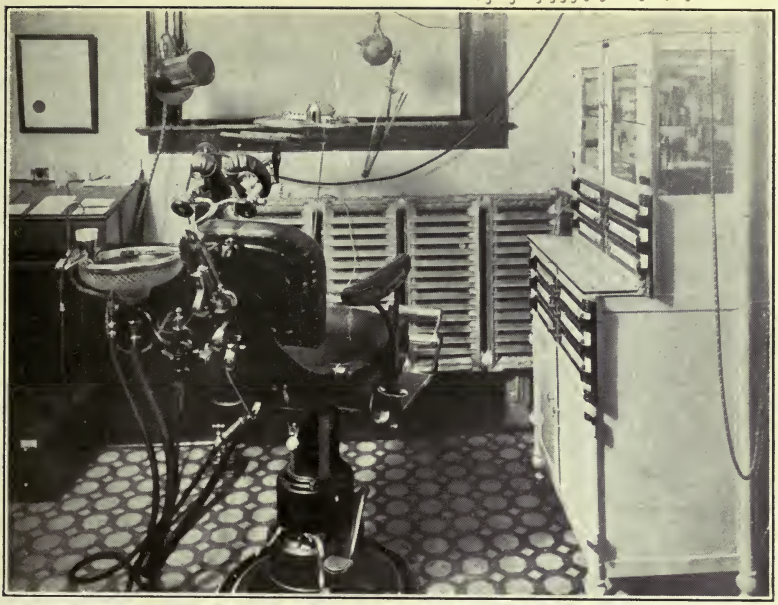
The time necessary to conduct these examinations is from three to five minutes per pupil. These figures show that both in time and in money, the necessary expenditure for conducting vision and hearing tests by teachers is slight.

Such tests do not take the place of thorough examinations by competent trained experts. It cannot be gainsaid, however, that they are of great and real value, and it is to be doubted whether, in the whole range of educational endeavor, there can be discovered another field where so great returns for good are to be secured at so small an expenditure of time and money.

SALARIES AND PER CAPITA COST FOR SALARIES

The great variation in the amount and character of work done in different systems of medical inspection renders a discussion of salaries most difficult. This is because of the inherent difficulty in comparing the work done in one locality per unit of salary with that performed in another. An idea of the salaries paid to school physicians and nurses in American cities may be gained from Table 29.* This table presents conditions in 1911 in 77 American cities of more than 8,000 population where the work was conducted under the auspices of the board of education. Data are taken from the investigation conducted by the

*See p. 104 ff.



The equipment of this Rochester dental clinic cost about $700.

Dental treatment costs less than the extra schooling bad teeth involve.

Russell Sage Foundation in the spring of 1911, and the figures for attendance are taken from the report of the United States Commissioner of Education for the year 1909–10. Data have been restricted to the cities where the work is conducted under the department of education, because it is frequently the case in systems under the board of health that part of the salary paid is in return for other sorts of inspection work conducted for the board of health.

It will be noted that the per capita figures presented in the table refer only to expenditures for salaries of inspectors and nurses and do not take into account sums paid for printing, supplies, equipment, and so forth. Cities where the systems of medical inspection do not include examinations for physical defects are indicated. All other rates thus apply to relatively complete systems, including physical examinations as well as inspections for the detection of contagious disease.

In the 52 cities where physical examinations are conducted, the average per capita rate is 24 cents, while in the other 25 cities it is slightly over 13 cents. Only six cities pay more than 50 cents per child for medical inspection, and of these, two are in California and four in New Jersey. Unfortunately, it is impossible from the data at hand to determine a minimum per capita rate for efficient medical inspection including adequate follow-up work. It is worthy of note, however, that among the 19 cities listed in this table employing school nurses the average per capita rate is 30 cents, and it is probable that this sum may fairly be regarded as a minimum for securing an adequate and efficient system.

Salaries of School Physicians and Nurses

Professor William Osler is credited with saying, as already quoted, in regard to the work of medical inspection in England: "If we are to have school inspection, let us have good men to do the work and let us pay them well. It will demand a special training and a careful technique." It is certainly to be regretted that this point of view has not been more generally taken in America. In this country the financial remuneration of school physicians and school nurses is almost invariably inadequate. The salaries paid range from nothing to $4,000 per annum.

TABLE 29.—NUMBER AND SALARIES OF MEDICAL INSPECTORS AND SCHOOL NURSES, AVERAGE SCHOOL ATTENDANCE, AND TOTAL ANNUAL EXPENDITURE AND EXPENDITURE PER PUPIL IN AVERAGE ATTENDANCE FOR SALARIES OF MEDICAL INSPECTORS AND SCHOOL NURSES IN 77 AMERICAN CITIES OF MORE THAN 8,000 POPULATION. 1911

State and city	Medical inspectors		School nurses		Total annual expenditure for salaries of medical inspectors and school nurses	Average school attendance 1909–10	Annual per capita cost for salaries of medical inspectors and school nurses
	Number employed	Annual salary	Number employed	Annual salary			
ALABAMA							
Birmingham	1	$1,500	2	$760	$3,020	14,062	$ .21
ARIZONA							
Phoenix	1	450	..	..	450	1,436	.31[a]
CALIFORNIA							
Berkeley	2	2,400 1,500	1	1,200	5,100	5,576	.91
Pasadena	1	1,600	1	900	2,500	4,378	.57
San Diego	1	1,000	..	..	1,000	4,664	.21
Santa Rosa	1	250	..	..	250	1,392	.18[a]
CONNECTICUT							
Meriden	3	250	1	600	1,350	3,794	.36
New Britain	1	500	..	..	500	5,316	.09[a]
GEORGIA							
Atlanta	1	2,000	3	750	4,250	15,992	.27
ILLINOIS							
Rockford	1	600	2	600	1,800	6,082	.30
IOWA							
Burlington	..	..	1	900	900	3,457	.26[a]
KENTUCKY							
Newport	2	250	1	500	1,000	2,204	.45

LOUISIANA							
New Orleans	3 { 1	1,800	..	..			
	2	1,200	..	..	4,200	29,095	.14
MAINE							
Augusta	2	100	..	..	200	1,656	.12[a]
Bangor	4	250	..	..	1,000	2,883	.35
Portland	4	200	..	..	800	7,905	.10[a]
MASSACHUSETTS							
Adams	4	125	..	..	500	1,684	.30
Attleboro	1	300	..	..	300	2,058	.15
Brockton	2	200	1	800	1,200	8,115	.15
Chelsea	3	300	..	..	900	3,364	.27
Clinton	1	400	..	..	400	1,808	.22
Danvers	1	200	..	..	200	1,418	.14
Fitchburg	2	225	..	..	450	3,810	.12
Gardner	5	50	..	..	250	1,636	.15[a]
Greenfield	1	300	..	..	300	1,600	.19
Leominster	2	300	..	..	600	2,051	.29
Lowell	9	200	1	650	2,450	11,210	.22
Malden	4	125	..	..	500	6,231	.08
Marlboro	1	200	..	..	200	2,230	.09[a]
Medford	1	200	..	..	200	3,880	.05[a]
Salem	1	650	..	..	650	4,320	.15[a]
Saugus	3	50	..	..	150	1,560	.10
Taunton	1	800	..	..	800	4,136	.19
Ware	4	100	..	..	400	1,040	.38
Westboro	1	100	..	..	100	1,967	.05
Woburn	1	200	..	..	200	2,768	.07
Worcester	15	200	..	..	3,000	18,211	.16
MICHIGAN							
Ann Arbor	1	900	..	..	900	2,205	.41[a]
Kalamazoo	1	500	1 (half time)	250	750	4,781	.16[a]
Muskegon	3	300	1	700	1,600	3,538	.45
Saginaw	6	125	..	..	750	6,442	.12

[a] Medical inspection includes contagious disease inspection and vision and hearing tests only—not complete physical examination.

TABLE 29.—(*Continued*)

State and city	Medical inspectors		School nurses		Total annual expenditure for salaries of medical inspectors and school nurses	Average school attendance 1909–10	Annual per capita cost for salaries of medical inspectors and school nurses
	Number employed	Annual salary	Number employed	Annual salary			
MINNESOTA							
Duluth	2	$1,000	2	$750	$3,500	11,580	$ .30[a]
Minneapolis	7	700	7	650	9,450	37,476	.25
MISSOURI							
St. Joseph	1	315	..	..	315	8,747	.04[a]
Sedalia	1	100	..	..	100	2,808	.04[a]
NEW JERSEY							
Asbury Park	2	{500 / 600}	..	..	1,100	1,624	.67
Bayonne	1	1,500	..	..	1,500	7,757	.19
Bloomfield	2	350	..	..	700	2,003	.35
East Orange	3	500	..	..	1,500	4,541	.33
Elizabeth	2	350	..	..	700	6,929	.10
Englewood	1	350			350	1,500	.23
Hoboken	3	1,000	1	1,000	4,000	7,919	.51
Kearney	6	250	..	..	1,500	2,405	.62
Long Branch	2	600	..	..	1,200	2,209	.54
New Brunswick	1	750	..	..	750	2,237	.34
Passaic	4	400	..	..	1,600	6,150	.26
Paterson	6	250	..	..	1,500	17,199	.09
Perth Amboy	1	600	..	..	600	4,540	.13[a]
Trenton	9	200	2	{600 / 650}	3,050	10,038	.30
NEW YORK							
Yonkers	2	500	1	800	1,800	9,975	.18

OHIO							
Dayton	1	2,000	..	..	2,000	13,473	.15
Elyria	1	850	..	..	850	1,914	.44
PENNSYLVANIA							
Danville	1	100	..	..	100	1,200	.08[a]
Erie	1	450	2	720	1,890	6,821	.28
Lancaster	1	500			500	5,132	.09[a]
West Chester	1	500	..	..	500	1,366	.36[a]
Wilkes Barre	1	1,000	..	..	1,000	8,244	.12
RHODE ISLAND							
Central Falls	3	200	..	..	600	1,553	.39[a]
East Providence	1	600	..	..	600	2,238	.27
TEXAS							
Galveston	1	600	..	..	600	3,489	.17[a]
Houston	1	750	..	..	750	9,065	.08[a]
San Antonio	1	300	..	..	300	9,502	.03[a]
WASHINGTON							
Spokane	6	500	..	..	3,000	12,957	.23
Tacoma	2	600	2	900	3,000	10,160	.30
WEST VIRGINIA							
Parkersburg	1	200	..	..	200	3,007	.07[a]
WISCONSIN							
Beloit	1	400	..	..	400	2,512	.16
Superior	1	450	..	..	450	4,978	.09[a]
Total cities making physical examinations	148	..	29	..	$83,460	350,022	$ .24
Total cities not making physical examinations	35	..	4	..	$14,565	107,181	$ .13
Total	183	..	33	..	$98,025	457,203	$ .21

[a] Medical inspection includes contagious disease inspection and vision and hearing tests only—not complete physical examination.

In many localities the local medical association conducts inspection for a year or two without cost to the city in order to demonstrate its value. This is why the tabulated returns show that in a considerable number of cities the physicians and nurses receive no pay. It may also be a factor in bringing about the extremely low salaries that are received after regular payment is given.

The following table is made up from the study of conditions in 1,038 cities and shows the number reporting salaries in which the salaries of physicians and nurses fall within the limits named in each group. That is to say, the first line shows that there are 75 cities in which the physicians give their services and 21 in which the school nurses do the same. The second line indicates that there are 47 cities in which the salaries paid to the physicians are between $1.00 and $100 per annum, and so on.

TABLE 30.—ANNUAL SALARIES OF PHYSICIANS AND NURSES IN ALL CITIES REPORTING

Annual salary	*Cities in which physicians receive salary indicated*	*Cities in which nurses receive salary indicated*
No salary	75	21
$1–$100	47	..
$101–$200	50	..
$201–$300	44	2
$301–$400	25	..
$401–$500	24	1
$501–$600	18	21
$601–$700	2	17
$701–$800	12	24
$801–$900	6	15
$901–$1,000	13	2
$1,001–$1,500	18	2
$1,501–$2,500	7	..
$3,500–$4,000	3	..
Fees according to service	19	1
Total	363	106

The table shows that there are more cities paying their school physicians at the rate of between $100 and $200 per year

than there are paying salaries of any other amount. On the other hand, the average salary is somewhat higher than this. If computed on the basis of the table, without taking into account the number of physicians employed in each individual city, the average salary would fall within the group receiving from $201 to $300.

Of course the sum of $200 per annum paid to school physicians is given in return for only a part of their time. Nevertheless, it has come to be regarded as a somewhat standard rate of remuneration for school physicians all over America. There are cases where so little work is required that this amount may be considered adequate, but undoubtedly in most cases it represents either an undue degree of sacrifice on the part of the school physician or inadequate work.

That the words of the eminent Oxford professor have been heeded in his own country seems evident from the salaries paid to the medical inspectors of schools in England. Almost without exception salaries are appreciably higher than those paid in America, and more liberal provision is made for clerk hire and for meeting incidental expenses. Indeed, the undoubted fact is that the whole movement has been placed on a higher plane in England than in the United States. Nevertheless, the situation in England with respect to remuneration for school medical work is still such as to call forth much criticism from the British medical societies. It appears that the dominant idea at the time that medical inspection was inaugurated under the board of education was that inspectors should be paid at the rate of from 25 to 60 cents for each child examined. However, no definite financial standard was established and much dissatisfaction has resulted. The British Medical Association recently took up the subject and attempted to formulate a standard which may be summarized as follows:*

Payment to be based on time spent in school work (including advisory and supervisory work), not on number of children examined.

Salary for part-time officers: $250 per annum for one session per week, or $200 per annum in the case of inexperienced beginners. (Women to receive same salaries as men.)

Not less than $2,500 per annum for experienced whole-time officers; young assistants, $1,250 to $1,500 per annum.

*Hogarth, A. H.: Medical Inspection of Schools, p. 136. London, Henry Frowde, Oxford University Press, 1909.

In many instances salaries are now paid on a scale equal to that indicated. Thus the town of Guilford, England, has appointed a chief medical officer at $3,000 to be increased to $4,000 by equal increments, and four assistants at $1,250 each, besides an allowance of $200 to each physician for traveling expenses. Northampton has employed two inspectors at $1,500; Stafford has one at $1,515 and three at $1,250, with provision for increase to $1,500 and for payment of expenses and clerical assistance. It must be remarked in considering these English salaries that the amounts paid represent relatively greater incomes than do the same sums in America. Moreover, the English code provides for but three physical examinations in the course of the school life of the child, whereas the Massachusetts law, where the standard salary of the school physicians is $200 per year, requires that such a complete physical examination of each child be made every year.

Cost of Clerical Assistance

A feature of the financial administration of medical inspection which has received adequate attention abroad, but which has been almost entirely neglected here, is that of furnishing medical inspectors with adequate clerical assistance. In the nature of the case, the work requires the making of a great many entries on individual record cards or sheets; and upon the thoroughness and system with which this is done depends to a large degree the efficacy of the work. Recent careful timing of work done by one of the most skilful examiners in the employ of the New York City board of health shows that it took him on the average about twelve minutes to make each physical examination. Half of this time was employed in conducting the examination itself and the other half was spent in the purely clerical work of entering results on the sheets. The very writing of the names of the pupils on their individual record cards and those of the parents on notification cards often consumes a great deal of time in some quarters of the city, and constitutes a class of work which ought not to be foisted upon a trained physician. Here are some names taken more or less at random from the school registers in a Polish section:

Rzemieszkievicz	Klymezynski
Zdrojewski	Wrzesimski
Gorzelanczyk	Guleszecwicz

When a physician is being paid at the rate of from $1.00 to $2.00 per hour, it is certainly a most unbusinesslike and inefficient policy to require him to spend half of his time doing work which a clerk at $12 or $15 a week could perform equally well. The physician above mentioned said in answer to a query that he felt sure he could examine twice as many children in the given time if he had the help of a clerk, and that he would find the work much more agreeable. This is a matter which demands attention wherever systems of medical inspection are to be installed. It is at present one of the weak points of all American systems.

EQUIPMENT

For School Physicians

The following statements concerning the necessary equipment for school physicians and school nurses are taken from an article* published in 1911 by Dr. George J. Holmes, Supervisor of Medical Inspection of Newark, N. J. They are based upon extended and successful experience.

The school physician's room should be "well lighted, painted white or light colored, wood floor." It should contain the following equipment:

One or two small, flat-top tables with a drawer, painted white enamel
Chairs rather than benches
Wash basin and running water
Paper towels
White enamel pail for waste materials
Screen
Window shades operated from below upward
Wooden tongue depressors
Eye charts (Snellen's and illiterate)
Medical cabinet of wood, with lock and key for medical and surgical supplies of nurses and physicians

* Journal of the Medical Society of New Jersey, 1911

File boxes and index for filing physical examination cards
Absorbent cotton, bandages, alcohol, bichloride tablets, tincture of green soap, quart jar with screw top for bandages and dressings
Full list of printed forms used by inspectors

For School Nurses

The following is a list of supplies used by nurses in schools:

Absorbent cotton, ¼ lb. pkg.
Adhesive plaster, 2 in. by 10 yds.
Alcohol, grain, 95 per cent
Bandages, 1 in. by 10 yds., Linton gauze
Bandages, 2 in. by 10 yds., Linton gauze
Plain gauze, 1 yd. long, 1 yd. wide
Argyrol, 5 per cent
Bichloride tablets, 7½ gr.
Flexible collodion
Iodine, tincture
Lysol
Sulphur ointment
Sweet oil
Stearate of zinc (powder, in boxes)
White precipitate
Zinc ointment
Bottles, 4 oz., with corks
Ciliary forceps No. 1,628
Clinical thermometers
Ointment jars, 4 oz.
Tooth picks
Full list of printed forms used

Summary.—In summing up the problems of administration which relate to expense it can only be said that in this, as in all other branches of organized endeavor, cost varies with the extent and kind of work done. Examinations by teachers for the discovery of defects of vision and hearing involve only the added expense of the simple printed material required. Inspection by physicians for the detection of contagious diseases is inexpensive and of great value in its results.

Systems of medical inspection which include careful physical examinations of all children cost the most and are by far the most valuable. From a social and economic point of view they are by far the cheapest in the better sense of the word, as they are the most far-reaching both in their immediate and in their indirect results.

If, however, a system of medical inspection is to be efficient and effective for any considerable length of time, it is clear that adequate salaries must be paid to those in charge of the work.

Efficient work can not long be expected from volunteers, and perhaps even less will it be given by physicians who receive a bare pittance in return for their time and skill. Neither can it be expected that first class men will long be content to spend the greater part of their time in doing the purely clerical work of filling out blanks in duplicate and triplicate.

Permanent efficiency will require skilled workers, careful administration, and adequate remuneration.

CHAPTER IX

DENTAL INSPECTION

DR. WILLIAM OSLER is credited with saying, "If I were asked to say whether more physical deterioration was produced by alcohol or by defective teeth, I should say unhesitatingly, defective teeth." The history of the movement for dental inspection of school children shows that during the past decade educators and hygienists all over the world have been awakening to a realization of the truth and significance of Dr. Osler's statement.

Although the development of dental inspection both in America and abroad has come almost entirely within the past decade, the beginnings date back more than a quarter of a century. So far as is known the first free dental clinic in the world was established in Rochester, New York, more than twenty-five years ago. While this was not strictly a school clinic, work with children was done and the present movement might have had its inception there had not lack of support resulted in the closing of the clinic after some two years of existence.

Fifteen years later dental work for school children was seriously started in Germany and was soon followed by similar work in England, in the United States, and to some extent in other countries.

The movement owes its rapid development to the world-wide awakening to the importance of dental conditions and still more directly to the publication of the findings of school physicians employed in the work of medical inspection. These reports have shown with convincing consistency that a large proportion of all school children are suffering from decayed teeth. These results come from all civilized countries and reveal especially serious conditions in the poorer quarters of our great cities.

Thus Unghavari reported* as a result of his studies of dental conditions among school children in Hungary that 87 per

* Unghavari (Hungarian physician): A study in Scedegin. Referred to by W. H. Burnham in Hygiene of the Teeth, Pedagogical Seminary, September, 1906, p. 293.

Too late for effective treatment.

Each missing upper tooth renders useless the corresponding lower tooth.

cent had diseased teeth. An extensive investigation in Prussia* showed that among almost 20,000 children in 19 cities, 95 per cent were afflicted with dental caries. Dr. Henie† examined school children in Norway and found 97 per cent with decayed teeth. Investigations conducted in Dunfermline, Scotland,‡ showed that 96 per cent of the children needed dental attention. Among 2,200 pupils in the public schools not a single child was found who had had dental care or whose teeth were filled or otherwise attended to. In America conditions are little if any better than abroad.

The serious significance of dental conditions existing among school children in a typical American city may be appreciated by studying the record of the examination of 447 school children ranging in age from six to sixteen years in Elmira, New York. These children were examined by local dentists in 1910.§ The findings are given in Table 31.

TABLE 31.—RESULTS OF DENTAL INSPECTION OF 447 CHILDREN, AGES SIX TO SIXTEEN, ELMIRA, NEW YORK, 1910

No. of children examined	447
No. of children with teeth in perfect condition	22
No. of cavities needing filling	2063
No. of teeth and roots needing extraction	617
No. of children needing teeth cleaned	425
No. of children needing gums treated	18
No. of children suffering with pus-discharging abscesses	15
No. of children in need of surgical treatment for irregular teeth	60
No. of teeth prematurely lost by extraction	315
No. of children with malocclusion	9
No. of children using tooth brush daily (condition of mouths did not verify this claim)	127
No. of children who had been to a dentist (in most cases for extractions only)	100

182 or 40 per cent of the children had fairly good masticating capacity.
119 or 27 per cent of the children had three-fourths masticating capacity.
106 or 24 per cent of the children had one-half masticating capacity.
38 or 8 per cent of the children had one-fourth masticating capacity.
2 children had no masticating capacity.

* Investigation made by an association of dentists in the province of Schleswig-Holstein. Zeitschrift für Schulgesundheitspflege, No. 7, 1900. Referred to by W. H. Burnham, op. cit.

† Dr. C. Henie (School physician in Hamar, Norway): Untersuchungen über die Zähne der Volksschüler zu Hamar in Norwegen. Zeitschrift für Schulgesundheitspflege, February, 1898, Vol. II, pp. 65–71. Referred to by W. H. Burnham, op. cit.

‡ Second Annual Report on the Medical Inspection of School Children in Dunfermline, Scotland, 1907, pp. 12–14.

§ Annual Report of Don C. Bliss, Superintendent of Schools, Elmira, N. Y., 1909–10, p. 30 ff.

The importance of these conditions is emphasized by a mass of information showing with startling distinctness that as civilization advances human teeth tend to become less efficient and even to disappear. According to Dr. Röse* only about 2 per cent of the Eskimos have defective teeth, 3 to 10 per cent of the American Indians, 3 to 20 per cent of Malays, 40 per cent of Chinese, and 80 to 96 per cent of Europeans and Americans. There is evidence showing that for centuries the lower face and jaws of civilized man have been deteriorating. An examination of 402 British soldiers† revealed the fact that only eight had a width of jaw equal to the average jaw width of the Roman soldier. The average American jaw has been found to be more than one-third of an inch narrower than that of the ancient Roman. These facts mean that we are here dealing with a problem in which we must do far more than merely let nature have her own way if we are to conserve normal healthy conditions.

There is another mass of evidence tending to show in definite, quantitative terms the importance of good teeth among school children. In Chapter XI, on Physical Defects and School Progress, are quoted data taken from an investigation in New York City which showed that, on the average, children having defective teeth take one-half a year longer to complete the elementary school course than do children not so afflicted.

In the *Nineteenth Century* for July, 1899, Dr. Collins‡ reports an investigation indicating that children with good teeth stand appreciably higher in scholarship and school promotion than do those having poor teeth.

In 1901, Dr. Johnson conducted an investigation in the schools of Andover, Massachusetts,§ which showed that in physical development as indicated by weight, children with good teeth were on the average about half a year ahead of children with poor

* Dr. Karl Röse, Die Zahnpflege in den Schulen. Zeitschrift für Schulgesundheitspflege, 1895, Vol. VIII, pp. 65–87. Referred to by W. H. Burnham, op. cit.

† Examination of British and American Soldiers. Referred to by E. S. Talbot: Degeneracy, Its Causes, Signs and Results. Contemporary Science Series.

‡ Collins, Dr. Edwin: The Teeth of the School Boy. *Nineteenth Century*, July, 1899, p. 84.

§ Johnson, Dr. George E.: The Condition of the Teeth of School Children in Public Schools. *Pedagogical Seminary*, March, 1901, pp. 45–58.

teeth. Again, Superintendent Verplanck of South Manchester, Connecticut, reported in 1910* that only 25 per cent of the children promoted at the end of the year had seriously defective teeth as compared with 38 per cent of the non-promoted children.

While such statistical evidence is not abundant, the data which exist show consistently a relation between dental conditions and mental ability.

DENTAL INSPECTION ABROAD

Germany

The first dental clinic for school children in Germany seems to have been established by Dr. Jessen in Strassburg in 1902. From its inception the work has had a marked success and has rapidly grown. At present Strassburg has a $60,000 building for a school dispensary. The children are examined upon their entrance into the public schools and twice a year thereafter until they reach the age of thirteen. The treatment furnished includes cleaning, fillings, and extractions. Parents able to pay are charged for the service, but the most necessitous cases are treated gratis and the deficit is made up by the municipality. The dentists are state officers receiving regular salaries and are not permitted to engage in private practice. One feature of the work is the supplying of tooth brushes to all patients.

The work initiated in Strassburg rapidly spread to other German cities and served as a model in the organization of many of the new systems. Cologne established a dental clinic in 1908 at an initial cost of $5,500. The school children are referred to the clinic by the teachers but they must secure the consent of their parents before being given dental treatment. The cost of maintenance amounts to from $6,000 to $6,500 annually, this sum serving to meet the salary expense of one director on part time, two assistants on whole time, and two nurses on whole time.

In the city of Hamburg work was begun in 1911 in connection with the dental clinic of the Municipal Insurance Committee. This clinic occupies twelve rooms and was designed to provide

* Annual Report of Fred. A. Verplanck, Superintendent of Schools, South Manchester, Conn., 1910, p. 37.

dental attention for domestic servants receiving the benefits of compulsory industrial insurance. It was found that the force and equipment were so ample that other work could be undertaken and the clinic arranged to treat 40 school children per day. Its support is guaranteed by a municipal appropriation of $2,000 per year for the three years 1911–14. The children treated are referred to the clinic by the school physicians.

In all, some 78 German cities and towns give some kind of dental treatment to school children. Of these 78 localities, 70 are cities of more than 10,000 population. The fact that the remaining eight cities have populations of less than 10,000 indicates that in Germany they have begun to realize that dental inspection, like medical inspection, is no less important in the small towns and rural districts than it is in the great centers of population. In about 30 localities the authorities have come to regard dental treatment as a necessary accompaniment of education and have made it free and universal. In twelve localities a more conservative course is followed and free treatment is furnished poor children only. A still more conservative attitude is represented by the course followed in 26 cities where the parents make small annual payments for the treatment furnished their children. These annual contributions vary in amount from 12 to 50 cents per child.

Of the 78 school dental clinics in the Empire 38 are municipal, three are attached to universities, three are in private hands, and the remaining 34 are conducted by dentists who give part-time service. The clinics vary in size from small ones of one or two rooms to those in Strassburg and Hamburg containing 10 and 12 rooms respectively.

There are three general plans of administration. In the first the dental clinic is maintained by the school authorities as an integral part of the educational system. In the second the clinics are supported by means of municipal grants to local dental associations. In the third, commonly adopted in smaller communities, arrangements are made with private dentists whereby school children needing treatment are sent to them on certain specified days.

The dental clinic has passed the experimental stage in

Germany. In no part of the public medical service have such valuable results been obtained through the expenditure of such small funds. The experience of many cities demonstrates that the health of the children has been markedly improved by dental treatment and that the work has been of genuine value in the campaign against tuberculosis and contagious disease. The number of children requiring treatment each year is steadily declining, and with the development of better conditions the number of extractions is becoming constantly smaller. Moreover, both children and parents appreciate the value of the dental work and voluntarily apply for treatment instead of having to be urged to submit to it as was formerly the case.

England

In England the first dental clinic was started in Cambridge in 1907 as a private venture. Two years later the work was taken over by the city. At the present time provisions for the dental treatment of school children are made in 16 cities. In three of these the clinic is connected with a public infirmary and supported by municipal contribution. In 12 cities the dental clinics are supported by separate institutions, and in five of these cases the dentists are employed on whole time and in the other seven on part time. One city employs part-time dentists but does not support a clinic.

Perhaps the most significant and interesting school dental work now being carried on in England is that conducted by the county of Somerset. In that county ten dentists are employed to care for the teeth of children in the villages and country districts as well as in the larger towns. They are paid at the rate of $7.50 per six-hour day and are allowed to give their time in either whole or half days. They are allowed 12 cents for material for each child treated and are granted allowances to cover reasonable traveling expenses. Wherever possible the work is done in the private office of the dentist, and where this cannot be arranged the school authorities set aside a room for the purpose. The instruments and appliances are supplied by the dentists.

Conditions among the English children have been found so serious that in general the object of the work is to prevent the

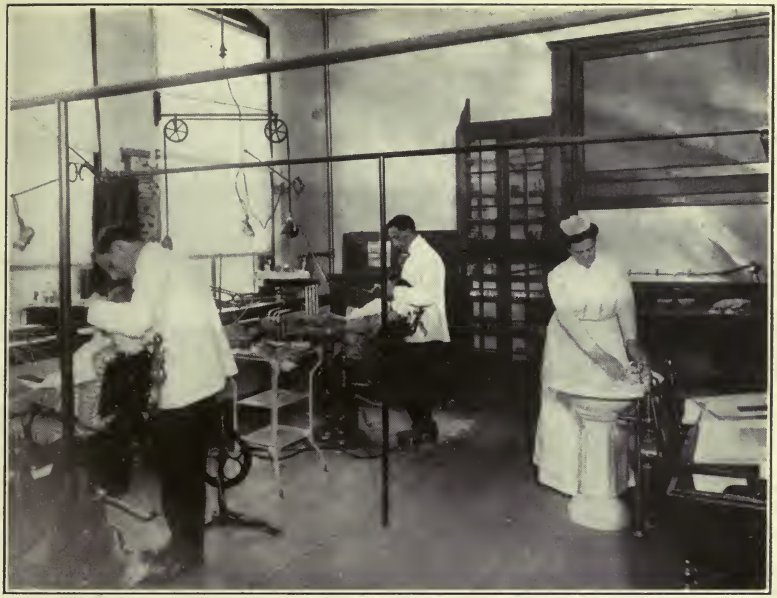
progress of dental deterioration rather than to cure the already existing conditions. The problem is to administer a limited force and limited funds so as to do the greatest permanent good to the greatest possible number of children. The solution has been found through beginning with the youngest children and, after once treating a child, assuming the responsibility for keeping its permanent teeth in good condition. This plan makes it possible to advance the age limit of caring for the children annually by one year, and in a few years will make it possible to include all, the oldest as well as the youngest. The basis of this plan is the proposition that it is better to clean and care for the teeth of nine children who have one decayed tooth apiece than it is to spend the same time caring for one child with nine decayed teeth. While this policy results in leaving many serious cases almost uncared for, it secures the maximum advantage for the minimum expenditure and will make it possible to cope with the entire problem within a few years.

Other Countries

Dental inspection is well under way in Wales and notably good work has been done in Scotland, especially in the town of Dunfermline. Dental clinics have been established for school children in several of the cities of Switzerland, Austria, and France, and the latest report from Russia tells of the establishment of nine dental clinics in the city of St. Petersburg.

DENTAL INSPECTION IN THE UNITED STATES

After the pioneer work carried on temporarily in Rochester, New York, a quarter of a century ago, the city again became a pioneer by establishing the first American school dental clinic in the modern sense of the term in 1905. This was made possible by the public spirited enterprise of Mr. Henry Lomb, who personally gave $600 and was instrumental in securing an equal amount from local merchants with which to purchase a $1,200 equipment. Premises for the clinic were supplied by the Public Health Association and work was at first carried on two afternoons each week. A little later there was a re-organization which resulted in the



Every pupil in Rochester, N. Y., needing dental inspection receives it.

Toothbrush drill in New York City.

employment of two dentists, one of whom was on duty each week-day from 2 to 5 p.m. These men were paid at the rate of $50 a month. This expense was met by Mr. Lomb. Since that time two other clinics have been established in two of the public schools.

In New York City there are 17 dental clinics. Fourteen of these are connected with general dispensaries or dental colleges and treat both adults and children; the other three are independent and are exclusively for school children.

In 1907 the Children's Aid Society of New York opened a clinic for the treatment of children enrolled in its schools. This clinic was so successful that another was established in 1909. The society meets the expense of equipment and maintenance, and members of local dental societies give their services.

In January, 1910, through the generosity of Judge Peter T. Barlow and several of his friends, a free dental clinic was opened to care for New York City school children whose parents are too poor to pay for dental treatment. Two dentists are employed and are on duty every afternoon from Monday to Friday inclusive, and on Saturday mornings. The board of health supplies a nurse to assist the dentists and to instruct the children in the care of the teeth.

In the year 1909, the work was begun in Cleveland, Ohio, and in Reading, Pennsylvania, and both cities have been leaders in demonstrating its value and contributing to its technique.

From these early beginnings the movement for dental inspection spread rapidly over the United States until in 1911 some 198 cities reported that such inspection was being carried on in their local schools. This does not mean, however, that the work has been in every case of the type under consideration. It frequently means only that the local medical inspector examines the children's teeth and advises them to secure dental treatment. However, dental inspection carried on by dentists was being conducted in 89 American cities at the close of the year 1911.

The number of cities in each division carrying on dental inspection and the number of cities where this work is done by dentists are shown in the following table:

TABLE 32.—CITIES OF THE UNITED STATES HAVING DENTAL INSPECTION AND CITIES HAVING DENTAL INSPECTION BY DENTISTS, BY GROUPS OF STATES. 1911

Division	*Cities having dental inspection*	*Cities having dental inspection by dentists*
North Atlantic	94	30
South Atlantic	15	8
South Central	8	4
North Central	59	39
Western	22	8
United States	198	89

Administration

In nearly all cases dental inspection in America has had its inception in volunteer work of the local dental association. This generally results in an arrangement whereby the association carries on demonstration work in the public schools. When the experimental stage is past the dental inspection in the public schools and the remedial work carried on through clinics are usually administered by the public school authorities and the dental association, acting in co-operation.

A good example of this sort of co-operation is found in Reading, Pennsylvania, where the medical inspectors in the public schools examine the children and select those needing treatment. The local charity organization society investigates the home conditions of candidates for gratuitous treatment and the local dental society supports the clinic and contributes professional services.

In New York City the clinics exclusively for school children are supported through the co-operation of the children's aid society, the dental societies, the board of health, and private individuals who have no connection with the public schools. In both Milwaukee, Wisconsin, and Ann Arbor, Michigan, a woman dental inspector is employed as a member of the staff of medical inspectors and recommends children for treatment, sending them either to clinics or to private dentists as their financial condition makes advisable.

The situation in Philadelphia is of particular interest because so far as is known that city is the only one which started dental inspection entirely through public funds. The work was begun by co-operative endeavor in which the municipality appropriated money for the establishment and equipment of a dental clinic for school children and the local dental societies carried on volunteer demonstration work for nearly a year. The success of this experiment led to the appointment of eight dentists on half time at a salary of $700 per year each, and the establishment of a second clinic in one of the public schools.

In Valparaiso, Indiana; Muskegon, Michigan; Cincinnati, Ohio; Elmira, New York; and in many other localities the work is carried on by arrangements between the public schools and the individual dentists in the locality. The case of Muskegon is particularly interesting because of the nature of the agreement entered into between the public schools and the dentists, and also because of the marked success attained. This agreement is shown by the accompanying reproduction of the blank used for the purpose.

AGREEMENT BETWEEN DENTISTS AND SCHOOLS, MUSKEGON, MICH.

To the Honorable, The Board of Education
of the Public Schools of the City of
Muskegon

Gentlemen:

I, the undersigned, am in favor of a Free Dental Clinic and agree to give at least one-half day of my time every three months, for a period of one year (from the date of the opening of the office), to the clinic established by the Board of Education in the Hackley School.

My understanding is that the dates of assignment shall be by lot. I will take charge of the office on the dates assigned to me, or send a substitute, provided I receive notice of the assignment two weeks before each date.

Muskegon, Mich.,————1911.

_____

Signature.

In Boston plans are under way looking toward the establishment of a free dental infirmary on a more extensive scale than any that exists elsewhere in the world. This will be made

possible through the gift of Mr. Thomas A. Forsyth who undertook the work in the desire to establish a highly practical charity in memory of his brothers. Mr. Forsyth's gift amounts to about $500,000 and it is hoped that this sum will be increased by other donations to a total of something like $2,000,000. The object of the foundation will be to co-operate with the school authorities in extending popular education in dental hygiene and in furnishing dental services free to every child in the city from early childhood to the age of sixteen. Already a charter has been granted by the Massachusetts legislature and land purchased for the erection of a building. The plan contemplates the most modern and complete equipment possible.

Legal Provisions

Up to the present time New Jersey is the only state that has passed a legal enactment specifically providing for the public support of free dental clinics. This act was passed in March, 1911, and is as follows:

Be it enacted by the Senate and General Assembly of the State of New Jersey:

1. Section one of an act of the Legislature of this State, entitled, "An Act to authorize cities of this State to make annual appropriations to incorporate dental associations of this State conducting and maintaining dental clinics in such cities for the free treatment of indigent persons," approved April ninth, one thousand nine hundred and ten, be amended so that the said section shall read as follows:

1. Whenever any dental association regularly incorporated under the laws of this State shall maintain and conduct in any city of this State a dental clinic or clinics where indigent persons residents of such city may receive treatment and relief without charge or fee therefor, it shall be lawful for the board or body having control of the finances of such city to appropriate and pay to such association, each year, such sum or sums, not exceeding in all the sum of five thousand dollars, as it shall deem advisable, to be used and applied by such association only for the support, maintenance and equipment in such city of a dental clinic or clinics, for the free treatment of indigent persons, residents of such city and for no other purpose whatsoever.

2. This act shall take effect immediately.

Approved March 30, 1911.

Cost of Supplies and Equipment

Experience in the equipment of dental clinics shows that the cost of a complete, high grade equipment with one chair is approximately $700. As the number of chairs increases, the cost per chair becomes somewhat less because all of the equipment does not have to be duplicated for every new chair installed. The common items of expense are about as follows:

Chair	$170
Table	10
Flush spittoon with water attachment	60
Electric engine	140
Electric heater and sterilizer	25
Excavators	18
Chisels	25
Appliances for use with engine	75
Miscellaneous hand instruments	50
Initial supplies	127
	$700

These figures are taken from the accounts of the Philadelphia clinic. They agree substantially with data from other cities.

In New York City it has been found that the expense for establishing a clinic is about $750, and the annual maintenance costs about $250, not including payment for the services of the dentists. In one clinic of two chairs, where equipment and supplies, the expense of rent, salaries of two dentists and a nurse, etc., were met from clinic funds, the total expenses for one year were $4,631.31. Of this sum $1,129.61 was expended on permanent equipment; the remaining $3,501.70 represented the cost of maintenance.

The directors of the Elmira clinic figure that with an annual appropriation of $400 they can meet the running expenses of the clinic, including supplies, laundry, and incidentals.

In Muskegon, Michigan, an equipment with one chair cost $750 and in Rochester, New York, one with two chairs cost $1200. In Reading, Pennsylvania, a most excellent outfit with one chair was secured for about $600, but because of donations and specially reduced prices this represents a real value of more nearly $1000.

Per Capita Cost

The best data as to per capita cost are drawn from the European experience. In Hamburg it is found that the average

cost of treatment per child is about 26 cents. Of this amount 14 cents is paid out of the municipal grant and the remaining 12 cents is paid by the parents, or in necessitous cases by the Poor Law Committee. German experience in general shows a per capita cost for children treated varying from 20 cents to 47 cents. The experience of 12 municipal districts is shown in the accompanying table.

TABLE 33.—DENTAL INSPECTION OF SCHOOL CHILDREN IN TWELVE GERMAN MUNICIPAL DISTRICTS. YEAR ENDING APRIL, 1911

Municipal district	*Number of school children*	*Number of rooms in clinic*	*Initial capital outlay*	Annual cost of maintenance		*Number of children treated*	*Per capita cost*
				Salaries	*Material*		
Berlin I	230,000	6	$1,944	$2,736	$486	12,000	$0.27
Berlin II	..	7	2,586	2,620	..	13,132	.20
Charlottenburg	24,000	6	..	3,353	..	9,949	.34
Cologne	69,293	10	3,475	2,187	..	..	..
Dortmund	35,000	7	1,944	2,430	729	..	..
Dinsburg	34,000	5	1,166	2,916	1,215	8,735	.47
Schöneberg	12,696	4	875	1,944	340	8,311	.27
Stuttgart	20,000	4	2,187	1,604	..	6,778	.24
Darmstadt	9,057	6	1,458	1,312	486	..	..
Colmar	6,200	3	972	1,045	170	3,095	.39
Mülhausen	19,500	3	..	1,312	267	3,610	.44
Strassburg	20,680	10	..	2,775	..	7,094	.39

According to the English experience one dentist working five days a week may be expected to care for the teeth of a school population of from 3,000 to 4,000 children. In the county of Somerset an allowance of 12 cents per child is made for material.

Reports from Rochester, New York, show that for 1910 the per capita cost for dental treatment was 57 cents. Of this sum 11 cents was for material used. In 1911 there was a per capita increase of 12 cents. This increase was due to the fact that during 1910 most of the material had been given, while in 1911 practically all of it was purchased from the clinic funds.

According to the charter of the Elmira School Dental Infirmary no charges can be made for treatment.

The Newark, New Jersey, clinic treats all school children free, but they can donate any sum they wish toward the support of the clinic.

In Lynn, Massachusetts, the dental dispensary in connection with a Neighborhood House makes a flat charge of 15 cents for cleaning, 10 cents for extractions, and 25 cents for each filling. In Winchester, Massachusetts, nine local dentists devote half a day a week to treating poor school children at a flat rate of 25 cents per case.

Salaries

In Strassburg, Germany, the dental clinic employs one director on part time, two assistants on whole time, and two nurses at an annual expenditure of $6,000 to $6,500. In England, as has been mentioned, the dentists in the county of Somerset are paid at the rate of $7.50 for each six-hour day. In Philadelphia the eight dentists employed are paid $700 a year for half-time services. In Rochester, New York, dentists working from two to five o'clock each afternoon are paid at the rate of $50 per month.

The staff of the two Newark, New Jersey, clinics consists of one chief and four consulting dental surgeons, who give their services; four dentists, who are on half-time for six days a week, at an annual salary of $500 each; and two attendants on whole time at $520 each. In addition to this force several local dentists work without pay.

Ann Arbor, Michigan, has a woman dental inspector who inspects the children's teeth twice a year at an annual salary of $400.

Education in Dental Hygiene

One of the most valuable features of the work in dental inspection is the education of teachers, children, and parents in dental hygiene. Dentists have been wide awake to the importance of this feature and are carrying on, both abroad and in this country, an active campaign, the keynote of which is prevention and conservation. Work is carried on by means of leaflets, illustrated lectures, magazine and newspaper articles, and dental exhibits. In New York the state board of health has four dentists on its staff of lecturers and these men give illustrated lectures to teachers and parents in cities and towns throughout the state. The Virginia state board of health in March, 1911, issued for general distribution a bulletin on Good Teeth and Bad: The Essentials of Oral Hygiene.

In Valparaiso, Indiana, in 1911, local dentists made careful examinations of school children, and the results of their findings were made into tables and diagrams showing existing conditions. These were explained by one of the dentists at a teachers' meeting and the need for instruction on the care of the teeth was discussed. The result was the awakening of interest on the part of the teachers and the beginning of class-room instruction in dental hygiene. This was followed up by a dental exhibit shown in every school house of the city. Local cartoonists interested in the movement contributed drawings.

In 1910, through the activity of the Rochester, New York, Dental Association a lecturer who knew how to interest children was secured. For two weeks he gave illustrated talks in the different school rooms on the teeth and their care. At the end of the second week a mass meeting of citizens addressed by men of national prominence was held. This resulted in general and active support of the movement.

In Philadelphia every child receives a tooth brush and box of tooth powder when the work on its teeth is completed. Directions for brushing the teeth and the formula of the powder are printed on the label of the box. The following is a reproduction of the label:

COMBINED DIRECTIONS AND PRESCRIPTION FOR TOOTH POWDER, PHILADELPHIA

DIRECTIONS

Turn out about a teaspoonful of powder into the palm of one hand, touch the powder with the wet brush, and brush, (1) up and down the inside of the lower front teeth, (2) the right, and (3) the left side of the lower back teeth, (4) inside of the upper front teeth, (5) right, and (6) left side of the upper back teeth, (7) outsides of all teeth, upper and lower, brushing up and down.

To clean each of these seven divisions, first wet the brush, then dip it in the powder in the hand.

Brush the teeth at night and rinse the mouth night and morning with table salt dissolved in warm water.

PHILADELPHIA
Department of Public Health and Charities
BUREAU OF HEALTH
DENTAL DISPENSARY
Room 706, City Hall

TOOTH POWDER

FORMULA

Precipitated Chalk.....95%
Castile Soap. 3% | Oil of Birch..1%
Saccharin...⅛% | Oil of Peppermint.....½%

Compliments of the DENTAL CORPS

Persistently neglected teeth become mere putrescent stumps.

Reason enough for retardation: enlarged tonsils mean lowered vitality.

The Children's Aid Society of New York City sells tooth brushes for three cents apiece. A leaflet containing directions for the care and use of the teeth is distributed.

This leaflet reads as follows:

DIRECTIONS FOR THE CARE AND USE OF THE TEETH

A clean mouth is essential to
good health
Clean teeth do not decay

* * * * * *

Prepared by the

SCHOOL DENTAL CLINIC OF THE CHILDREN'S AID SOCIETY

For free distribution among the patients
of the School Dental Dispensaries

WHAT ARE YOUR TEETH FOR?

To grind the food into fine particles, and mix it with the saliva.

Food which is not thoroughly chewed causes indigestion and constipation.

HOW LONG SHOULD THE TEETH LAST?

Throughout life.

HOW DO WE LOSE THEM?

By decay and loosening.

WHAT CAUSES TEETH TO LOOSEN?

Deposits of tartar upon the teeth in contact with the gums, uncleanliness, and lack of use in chewing the food.

WHAT CAUSES TEETH TO DECAY?

Particles of food and candy sticking to them, lack of exercise in the thorough chewing of food, irregular teeth, also a poor physical condition.

WHERE DOES THE FOOD LODGE?

Between the teeth, in the crevices of the grinding surfaces, and along the margin of the gums.

CAN DECAY BE PREVENTED?

Yes, to a large extent.

HOW CAN DECAY BE PREVENTED?

By the thorough chewing of the food, by keeping the mouth clean through the careful use of the tooth brush with tooth powder or paste, and waxed silk, also by keeping up the general health. Such care will also prevent the teeth from loosening.

HOW OFTEN SHOULD THE TEETH BE CLEANED?

At least twice each day, before breakfast and at bed time. Better after each meal. Tooth powder or paste should be used morning and night.

HOW SHOULD THE TEETH BE BRUSHED?

In an up and down direction, allowing the brush to come well up over the gums in both jaws. This should be done on the outer surface of all the teeth. Then open the mouth and carefully brush the grinding surfaces, special care being given to those in the back part of the mouth. Then by tilting the brush, cleanse the inner surfaces of the teeth again allowing the brush to come well up on to the gums. The tongue should also be extended from the mouth and brushed.

ARE THE GUMS INJURED BY BRUSHING?

No, if brushed in an up and down direction. They will be strengthened by such brushing and rendered less liable to disease.

HOW OFTEN SHOULD THE TEETH BE EXAMINED BY A DENTIST?

At least twice each year.

WHAT IS THE PURPOSE OF THE DENTAL CLINIC OF THE CHILDREN'S AID SOCIETY?

To provide free dental treatment to the children of the school.

To teach them the care and use of the teeth.

To help them to understand that a clean mouth is as important as a clean body.

That food thoroughly chewed is more easily digested.

That good digestion is the first essential to health.

That well cared for teeth and a clean mouth help prevent tuberculosis.

That cleanliness and fresh air are the best safeguards against disease.

Waltham, Massachusetts, distributes a leaflet on the care of the teeth, addressed to the parents of the school children:

THE TEETH AND THEIR CARE

Waltham, Mass.

To Parents:

You are reminded of the necessity for early care of children's teeth. With such care, the teeth may be preserved throughout life. This will not only save much inconvenience and discomfort in later life, but it may enable the child in the meantime to live a more vigorous and hence a more successful life.

The condition of the teeth has much to do with the general health.

The following cautions, abbreviated from those issued to teachers and school physicians by the Massachusetts board of education, are commended to your attention:

Unclean mouths promote the growth of disease germs, and cavities in the teeth are centers of infection.

Irregularities of the teeth, especially those which make it impossible to close the teeth properly, thus leading to faulty digestion and faulty breathing, should receive careful treatment.

The first permanent molars are perhaps the most important teeth in the mouth. They come at about the sixth year, immediately following the temporary teeth, and are the most frequently neglected because they are often mistaken for temporary teeth.

It should be known that decay of the teeth is caused primarily by the fermentation of starchy foods and sugars, and that the greatest factor in preventing disease of the teeth is the removal of food particles by frequent brushing. Children should be prevented from eating crackers and candy between meals, and when possible the teeth should be cleaned after eating. Inspection of the teeth by a dentist should be made at least once or twice a year.

Your attention is also called to the prevalence of maladies of the nose and throat.

The health of a child and his ability to do his school work may be seriously impaired by the presence of adenoid growths. When a child shows obstruction of the nose by mouth breath-

ing, snoring, continual discharge, or recurrent ear trouble, adenoids should be suspected.

Enlarged tonsils, recurrent tonsilitis, and enlargement of the glands in the neck also constitute a serious handicap to the child. Either condition must be remedied before he can have a fair chance in the world, and the earlier the better. The family physician should be consulted and the child given such treatment as he may advise.

Waltham, Mass.,
January 1, 1908.

In many California cities the school authorities distribute a series of health pamphlets prepared by Dr. Ernest Bryant Hoag.* In this series belongs the following on The Causes, Results, and Prevention of Poor Teeth.

HEALTH PAMPHLET NO. 3
by
Dr. Ernest Bryant Hoag

The Effects of Decayed Teeth

It has been shown by examination of school children throughout the United States that from *seven to eight out of every ten have decayed and defective teeth, needing the care of a dentist.*

The condition of the teeth has a *very important bearing on the health of the child.* By early attention not only much inconvenience, discomfort and greater expense in later life may be saved, but it will enable the child in the meantime to live a more vigorous life and be more healthy.

Very often business men do not want in their employ people whose breath is offensive, whose teeth are decayed, blackened and unsightly.

It is the best of economy on the part of the parent to have the teeth of the children examined once or twice a year by a dentist. If the cavities become large the expense of filling and the pain suffered will be greater, or the tooth will be lost.

It is frequently thought that baby teeth may be neglected, that the cavities are of no importance. *This is wrong. Digestive troubles and poor nutrition* are frequently traced to the neglect.

* For other pamphlets in this series, see pp. 80–82.

Baby teeth can be filled with cement easily and with little pain.

Neglect of baby teeth is often the cause of the coming in of irregular permanent teeth.

Irregular teeth are unsightly. The *irregularity often causes imperfect closure and inability to chew the food.*

Poor mastication of food in childhood is often the *cause of serious stomach disorders.* This means prolonged suffering and doctors' bills.

Food which is not thoroughly chewed causes constipation and indigestion.

Decay of teeth can be prevented.

An unclean mouth is an excellent place for the growth of disease germs.

It is a fact that *tuberculosis often gains entrance to the glands* of the neck and so to the lungs through decayed places in the teeth.

Abscesses of the jaw and glands of the neck come from decayed teeth.

Bad conditions of nose, throat and ears are made worse by decay of teeth.

Causes of Decay

Small particles of food lodging along the gums, in cavities and between the teeth ferment. The protecting enamel is dissolved by the substances formed by this fermentation. Cavities result. The gums are also liable to become diseased.

The loosening of teeth and disease of the gums is, in nearly all cases, caused by collections of tartar.

Tartar collects on the teeth of every person. It frequently collects along the teeth down under the gums where it can only be reached by the dentist's instrument.

The Armenians are noted for their beautiful and perfect teeth. The children are taught to clean their teeth after anything being taken into the mouth, even an apple.

If a child is taught to use a tooth brush in early life he will be apt to take proper care of the teeth throughout life. It is very important to establish cleanly habits.

It is more important for children to brush the teeth than to wash the face.

RECORD FORMS AND BLANKS

The simplest systems of record keeping used in connection with dental inspection consist merely of small charts showing in outline a full upper and lower set of teeth. By marking these pictured teeth the medical inspector indicates which of the child's teeth are in need of attention.

In a fully developed system of dental inspection including dental clinics and examinations of children in the schools by dentists, work is facilitated by using a set of nine or ten records each serving its own end. Perhaps the most satisfactory record system of this sort is that in use in connection with the dental clinics of Philadelphia. Because these records are so well adapted for the work they are designed to do it seems worth while to present the series in detail.

The individual record card, the face and reverse of which appear on pages 135 and 136, measures 5 x 8 inches and is designed to record the salient data concerning the teeth of one child.

After the child has been examined and a condition found which requires treatment, a notice, reproduced on page 137, is sent to the parent telling him what has been discovered and advising that the child be treated by a competent dentist.

If the notification to the parent brings to light the fact that he desires to have his child receive dental attention but is unable to pay the cost, the dental inspector and the principal jointly issue a certificate, shown on page 138, authorizing the child to be treated at the dental dispensary.

When the child visits the dispensary he is given a small appointment card—see page 139—measuring 2½ x 3½ inches, on which are written the date and hour of his appointment and which contains spaces where the dentist indicates the dates on which he worked. One end served by this card is to insure that the same dentist shall carry the case through to a conclusion. Directions for brushing the teeth are on the reverse of the card. These are the same as those already reproduced on page 128 as part of the label on the tooth powder box.

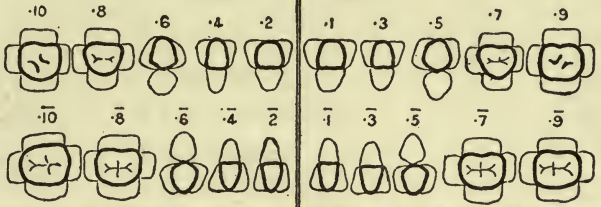
EXAMINATION CHART

.....191

Name	Sex		Color		Section
Address	M		W		School
Age Yrs. Mo.	F		B		Grade
Nationality			Y		Standing

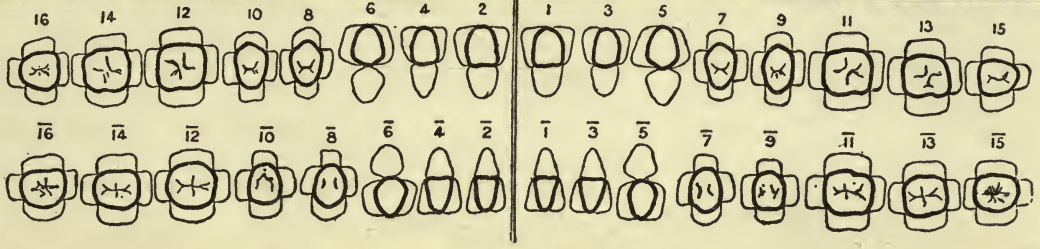
MARK EXTENT AND POSITION OF DECAY.

RIGHT. LEFT



SYMBOLS.

Tooth Lost (temporary)	—
Tooth not Erupted ...	|
Tooth Extracted ...	X
Tooth requiring Xt. ...	/
Tooth with Fistula ...	⊙
Tooth Erupting ...	Λ



Form 8 D. D.

(OVER)

PHILADELPHIA—BUREAU OF HEALTH—DIVISION OF SCHOOL INSPECTION
DENTAL INSPECTION OF SCHOOL CHILDREN

(√) CHECK ANY OF THE FOLLOWING CONDITIONS FOUND

STATE OF TEETH		TARTAR			No.		
Clean		Little		Natural arrest of Caries		Hare Lip	
Fair		Much		Fractured Teeth		Cleft Palate	
Dirty		TOOTH BRUSH		Fistulæ		Hard / Soft	
Foul		Used		Fistula Opening on Face		Mouth Breather	
Stained		Not Used		Supernumerary		Much Caries / Little Caries	
IRREGULAR		Has None		Hutchinsonian Teeth		Enlarged Tonsils	
Upper				Honeycombed		Necrosis of Bone	
Lower				Teeth Filled		Cicatricial Attachments	
						Closure of Jaws	

Remarks:

.....

.....*Inspector*

NOTICE TO PARENT, PHILADELPHIA

Form 9 D. D.

CITY OF PHILADELPHIA

Department of Public Health and Charities

BUREAU OF HEALTH

DIVISION OF SCHOOL INSPECTION

DENTAL DISPENSARY
ROOM 706, CITY HALL

PHILADELPHIA,.....191...

Mr.....

.....

Dear.....

This is to notify you that your child ..... attending ..... School, is in need of Dental treatment.

.....progress in school is retarded by impairment of .....general health, resulting from decayed teeth.

For the best interests of your child we strongly advise that.....teeth be treated at once by a competent dentist.

For further information call at the school and consult the Principal.

.....

.....INSPECTOR

.....

PRINCIPAL

PLEASE BRING THIS NOTICE WITH YOU TO THE SCHOOL

CERTIFICATE FOR FREE TREATMENT, PHILADELPHIA

Form 6 D. D.

CITY OF PHILADELPHIA

DEPARTMENT OF PUBLIC HEALTH AND CHARITIES

BUREAU OF HEALTH

DIVISION OF SCHOOL INSPECTION

DENTAL DISPENSARY
ROOM 706, CITY HALL

Philadelphia,.....191

THIS IS TO CERTIFY that.....

age..... Residence.....

School..... Section.....

Grade..... is in need of dental treatment and the parents are unable to pay for the same.

.....

..... INSPECTOR

.....
PRINCIPAL

PRESENT THIS CERTIFICATE AT ROOM 706, CITY HALL. Office Hours: Monday to Friday, 9 A. M. to 4 P. M. Saturday, 9 A. M. to 12 Noon.

APPOINTMENT CARD, PHILADELPHIA

CITY OF PHILADELPHIA
Department of Public Health and Charities

BUREAU OF HEALTH

DENTAL DISPENSARY: Room 706 City Hall.
Branch—Southwark School, 9th and Mifflin Sts.

..... HAS AN APPOINTMENT FOR	ATTEST WHEN PRESENT
Monday .....*at*.....	
Tuesday .....*at*.....	
Wednesday.....*at*.....	
Thursday.....*at*.....	
Friday.....*at*.....	
Saturday.....*at*.....	

BRING THIS CARD WITH YOU

Discharged.....*for*.....*Months*

SHOW THIS CARD TO YOUR TEACHER

DIRECTIONS FOR BRUSHING THE TEETH

Turn out about a teaspoonful of precipitated chalk into the palm of one hand, touch the chalk with the wet brush, and brush, (1) up and down the inside of the lower front teeth, (2) the right, and (3) the left side of the lower back teeth, (4) inside of the upper front teeth, (5) right, and (6) left side of the upper back teeth, (7) outsides of all teeth, upper and lower, brushing up and down.

To clean each of these seven divisions, first wet the brush, then dip it in the powder in the hand.

Brush the teeth at night and rinse the mouth night and morning with a teaspoonful of table salt dissolved in a tumbler of warm water.

After the pupil has been treated at the dispensary an individual record of the work done is made and filed. This is a card measuring 5 x 8 inches and its face is identical with that of the individual record card already reproduced. On the reverse are spaces for recording the date, the operation performed, and the name of the operator.

The school's record of the work done takes the form of a card measuring 5 x 8 inches and is kept by the principal. On this card, seen on the following page, are spaces for recording the names of the pupils and the dental inspector together with the action taken by the parent, private dentist, or dispensary.

The record of the work done by the individual dental inspectors takes the form of a card measuring 5 x 8 inches having spaces wherein the inspectors record each week the work done on each school day. This card is reproduced on page 141.

DENTAL INSPECTION ..... SCHOOL

DATE	NAME		TREATMENT NEEDED		PARENT		PRIVATE DENTIST	DISP. CERTIF.	TREAT-MENT SECURED	REMARKS
	PUPIL	INSP.	YES	NO	NOTIFIED	CALLED				
										(OVER)

Form 5—D. D.

CITY OF PHILADELPHIA

DEPARTMENT OF PUBLIC HEALTH AND CHARITIES

BUREAU OF HEALTH

DENTAL DISPENSARY
ROOM 706, CITY HALL

DIVISION OF SCHOOL INSPECTION

Dental Inspection of School Children

Report from.....School Section.....

For week ending.....191

	Pupils Examined	Treatment Recommended	Parents Notified	Parents Called on Principal	Private Dentist	Recommended to Dispensary	Treatment Secured	Remarks
MONDAY								
TUESDAY								
WEDNESDAY								
THURSDAY								
FRIDAY								
TOTALS								

.....

.....Inspector

For administration purposes the dental clinic keeps detailed monthly reports which are summaries of the individual reports received from the children and the schools. There are two principal record forms which are sheets designed for use in loose leaf binders. The first of these has spaces for recapitulating the work during each day of the month. The column headings are:

- Day of Month
- Daily Number of Patients
- Fillings
  - Amalgam
  - Gutta Percha
  - Cement
  - Copper Cement
- Canals
  - Dressed
  - Filled
- Pulps
  - Pulpitis
  - Capped
  - Devitalized
  - Extracted
- Pericementitis
- Alveolar Abscess
- Gingivitis
- Stomatitis
- Cleansing
- Extractions
- Miscellaneous

The second of the two recapitulation sheets has spaces for recording the work done each month by the individual inspectors. The column headings across the top of the sheet are:

Inspectors, Schools Assigned, Visits Made, Pupils Examined, Treatment Recommended, Parents Notified, Parents Called on Principal, Treated by Private Dentist, Recommended by Dispensary, Treated at Dispensary, Treatment Secured, Remarks.

SUMMARY.—In summarizing the situation with respect to the dental inspection of school children the most salient fact is that the commonest of all physical defects among school children is decayed teeth. Cases of dental defectiveness are frequently greater in number than are all other sorts of physical defects combined. Moreover, it is probably true that there is no single ailment of school children which is directly or indirectly responsible for so great an amount of misery, disease, and mental and physical handicap.

Within the past decade those having the greatest interest in the physical welfare of children have awakened to the existence of these conditions and vigorous steps have been taken to remedy them. First in Germany, next in England, and more recently in the United States dental inspection has been inaugurated and school dental clinics established. The means and methods developed have so conclusively demonstrated their usefulness that the movement is everywhere extending rapidly and steadily.

CHAPTER X

CONTROLLING AUTHORITIES IN AMERICAN MUNICIPALITIES

UNDER American systems of municipal government, the question as to whether medical inspection of schools is a proper function of the board of education or the board of health is bound to arise as soon as the organization of such a system is contemplated. The claims of both are certain to be warmly argued.

On the side of the board of health is the argument that the machinery of government already existing for the conservation of the health of the community may properly be extended to include new activities, and that another branch of the government should not duplicate social machinery already existing. It is further argued that an important feature of the medical inspection of schools is the detection and segregation of cases of contagious disease. This is a protective measure relating to the safety of the whole community, and as such should remain a function of the board of health.

The argument for keeping the work in the hands of the board of education is that the whole work, to be effective, must be closely related to school work and school records; that friction is inevitably produced when those in charge are in the employ of an outside body, neither responsible to nor perhaps in sympathy with those who have the schools in charge. This results in a loss of efficiency.

The further claim is made, and substantiated by referring to records in many cities, that the exclusion of cases of contagious disease is after all a comparatively small part of the work of medical inspection. Thus in Newark, New Jersey, in 1909–10, the total exclusions amounted to 4,955 in a school membership of

57,742, or about 8 per cent. In Cincinnati and Rochester in the same year the exclusions amounted to between 3 and 4 per cent, in Philadelphia and Spokane to 4 per cent of the membership. In the state of Massachusetts in 1907, towns and cities having an average attendance of 342,000 reported something more than 15,000 exclusions during the year. Again the percentage is 4. It should be mentioned that in many cities cases of pediculosis form a very large proportion of the diseases listed as communicable. In New York City, where only the worst cases of this class are excluded, the total exclusions in 1909–10 amounted to little more than 1 per cent (8,884) of a total membership of 744,148.

These facts have a direct and important bearing on the question at issue. The data showing that the proportion of cases requiring exclusion on account of contagious disease does not exceed 4 per cent of the school membership indicate that the portion of the work falling within the purview of the department of health is specific and limited. On the other hand, the fact that all the children need medical and sanitary supervision with respect to exercises, suitable seats and desks, type, paper, suitable hours of study and recreation, drinking water, physical and mental defects, and the like, indicates that the portion of the work which legitimately forms a function of the educational authorities is general in nature and almost unlimited in scope.

By far the most important evidence bearing on the problem is that drawn from the experience of American commonwealths and municipalities. Medical inspection laws, or regulations equivalent to laws, are now in force, as has been stated, in 19 states and the District of Columbia. It is most significant that in 17 of these 20 cases the administration of the provisions is placed in the hands of the educational authorities. In one case administration may be through either the department of health or the department of education, and in only two cases is it entirely in the hands of the health authorities.

No less striking is the situation among American municipal systems. In the early days of medical inspection practically all systems were administered by local boards of health, but as experience has accumulated the tide has turned until at the present time only about one-quarter are under boards of health and in

the remaining three-quarters the board of education is the controlling authority.

In the investigation conducted in 1911, as has been stated, the facts concerning medical inspection were gathered for 1,046 school systems in 1,038 cities and towns. Among these, 443 had systems of medical inspection. The following table shows how these systems were divided between the two forms of administration.

TABLE 34.—ADMINISTRATION OF SYSTEMS OF MEDICAL INSPECTION IN CITIES OF UNITED STATES, BY GROUPS OF STATES. 1911

Division	*Cities having systems of medical inspection*	*Cities having administration by board of health*	*Cities having administration by board of education*
North Atlantic	236	58	178
South Atlantic	23	7	16
South Central	35	12	23
North Central	109	21	88
Western	40	8	32
United States	443	106	337

A good idea of the feeling of those in charge of the work in localities where the question as to administration has been raised may be gained from reading some extracts, mostly taken from official reports made by executive officers.

In his report for 1907 (pages 142–3), William H. Maxwell, city superintendent of schools of New York, says:

"Dual responsibility in the school—that of the board of education and that of the department of health—always has resulted and always will result in confusion and inefficiency in the work effected. It is owing to this dual responsibility that the large annual appropriation made by the city for the physical examination of school children is to a great degree wasted. Efficient service will be obtained only when the board of education is made solely responsible for all the work that goes on in the schools.

"The physicians employed by the board of health do not perform any of the functions which it is highly advisable should be performed by a truly educational department of hygiene, such as studying hygienic condi-

tions in the schools and advising teachers regarding the pedagogical treatment of children in cases of fatigue and nervousness.

"The nurses employed by the department of health have done good work in visiting the homes of sick children, in giving advice and assistance to mothers, and in looking after slight ailments in the school. The fact, however, that they are under the control of an outside organization is a constant hindrance to their work. It is another instance of the evil effects which arise from dual control or divided responsibility. I risk nothing in saying that the school nurses would do much more and better work if they were made responsible to the educational authorities."

Dr. Thomas F. Harrington, of the department of hygiene, Boston, says* in speaking of the system of medical inspection by physicians in the employ of the department of health:

"The greatest criticism against this system of inspection is that it lacks uniformity; that it excludes pupils, and does not provide any means of 'follow up' nor any guarantee that the child will receive medical care; that the duties of the inspector as an agent of the board of health bring him in contact with much contagion in the homes; and finally, that the dual duties and divided responsibility are not conducive to the best in the health and efficiency of school children."

Speaking of the work of the school nurses, he says:*

"It does not seem possible to conceive a more satisfactory arrangement, nor a more effective piece of school machinery, than nurses under school supervision. With a corps of medical inspectors under this same supervision, who would conduct a daily clinic in their respective school districts, there are no problems connected with the health and efficiency of school children which could not be quietly, rationally, economically, and effectually solved. Until such an organization is perfected in part or in whole, little progress can result from the efforts to promote the health and efficiency of our school children."

The superintendent of schools of Boston in his twenty-seventh annual report, July, 1907 (page 39), says in regard to the Massachusetts law making medical inspection compulsory:

"In this connection it should be stated that while the school physicians were concerned solely with contagious diseases, they were properly to be controlled by the board of health. Under the new law, the work

* *School Hygiene*, Sept., 1908, p. 21.

of examining into any defect that interferes with the progress of the children in school is not in the main a question of public health. It is rather an educational question and is so directly allied to the work of the department of physical training that the school physician should be appointed by the school board and become a part of this department. The highest efficiency will be impossible until this action is taken."

The superintendent of schools of Cleveland says in his report for 1907 (page 42), after making an able plea for the establishment in the schools of the city of a system of medical supervision:

"While it has been suggested that the kind of service here treated should be performed by the board of health, it is the belief that medical supervision is peculiarly a function of the department of physical training and school hygiene, and that the board of health's relation to the schools should relate to the matter of communicable disease."

In his report for 1907 (page 119), Dr. Poland, the superintendent of schools of Newark, New Jersey, states that the medical inspection as conducted by the board of health has been satisfactory, but adds that the only objection that can be raised against it relates to the executive control of the staff of medical inspectors. He says:

"By additions to the staff, the number of medical inspectors now employed in the schools is 16. The direction and control of this large number requires some one who can give more time to it than is possible for the busy and overworked, but exceedingly efficient, health officer. It seems hardly fair to impose upon him in addition to his other duties the duty of overseeing daily the work of sixteen medical inspectors."

Dr. Fred S. Shepherd, superintendent of schools of Asbury Park, New Jersey, says in his report for 1907:

"Again, if the system is to work harmoniously, the medical inspector should work under the direction of the superintendent of schools, as do the teachers. If the medical inspector should regard himself as not called upon to accept any suggestions whatsoever from the school officers of administration, such as superintendents or school principals, it is plain that friction might arise. In this connection we should not overlook the fact that medical inspectors are human and have a few of the faults com-

mon to humanity. It is possible for them, as it is for teachers and others higher in authority, to slight their duties or to perform them in an inefficient and unsatisfactory manner. School boards are not able to pass judgment upon these inner workings of the system, and somebody should have the responsibility for holding even medical inspectors, if necessary, to the letter if not to the spirit of their obligations."

It is to be noted that Superintendent Shepherd is speaking, not from the point of view of the theorist, but from that of one experienced in conducting a school system which has a successful system of medical inspection conducted by physicians appointed by the board of education. In describing the workings of this system in actual practice, Dr. Shepherd goes on to say:

"It has been suggested in some quarters that medical inspection of school children should be one of the functions of the local board of health, in order to prevent clashing of authority. As boards of health are organized in our own state, however, I can see no likelihood of such cross purposes. I presume it does devolve upon local boards of health to inspect for sanitary purposes all public buildings, including the public schools. This, I judge, is also, or should be, one of the duties of the medical inspector. To have the public schools inspected intelligently by two such departments seems to me a good thing. What one might overlook, the other might see. Aside from this apparent overlapping of jurisdiction, I see little opportunity for any clashing of interest. On the contrary, it is possible for the very closest relations to be established between boards of health and the school medical authorities. How it might be in other cities of the state, I am not aware; but in the city of Asbury Park every case of contagious or infectious disease is reported immediately by the board of health to the school authorities, and vice versa."

That the fears expressed by Dr. Shepherd are not groundless is shown by experience in cities where the dual system of control is in practice.

Such an example comes to light in the city of Lawrence, Massachusetts. There medical inspection is, of course, conducted under the provisions of the state statute, which provides for the appointing of school physicians by either the school committee or the board of health. In Lawrence the threatened conflict occurred in August, 1907, when the board of health appointed

Waiting for the school physician in Toledo, Ohio.

Throat inspection in the Orange, N. J., schools.

five physicians to inspect both public and private schools. By an order of the school committee the principals and teachers were forbidden to extend official recognition to any but Dr. Bannon, who had been appointed by the school committee in August, 1906, for a term of three years. This state of affairs continued for some time and the schools were under a double inspection, with much consequent unavoidable friction.

One of the strongest arguments in favor of medical inspection under the authority of boards of education undoubtedly is that efficiency demands that there shall be the closest co-operation between the medical and educational authorities. If the children are to be benefited, if diligent effort is to be made to correct the defects found, if the physical conditions brought to view are to be used for the guidance of the teacher in the class room, then certainly such intimate relationships are essential.

It has been claimed that where inspection is conducted under the board of health this is difficult or impossible. Certainly an examination of the annual reports of some of the superintendents of schools in cities where it is so conducted would indicate that the educational authorities know little of the work that is being done, and so regard it as of slight importance as a guide in the class room. Examples of such an attitude as this are found in reports of the superintendents of schools of Haverhill and Springfield, Massachusetts, for 1907. The superintendent of schools of Haverhill disposes in his report of the subject of medical inspection with the following brief remarks (pages 32–33):

"The school physicians have continued their work on the same basis as last year, under appointment from the board of health. I am permitted to make the following summary of such portions of their work as admit of classification. A large proportion, perhaps the largest portion of their work, is not such as can be shown in the form of statistics."

Then follows a brief list of the diseases noted by the school physicians and of the statistics concerning vaccination. No details are given, nor is there any mention made even of the number of pupils examined. The report is confined to some 10 lines. Such comment certainly does not seem to indicate intimate knowledge

of what is being done, or a close relationship between the work of the school physicians and that of the educational authorities.

A similar condition seems to be revealed in Springfield, where the sole comment of the school board on the work of the physicians appointed by the board of health is (page 17), "So far as we can learn, the inspectors are fulfilling their requirements and parents generally follow the advice given."

In Massachusetts, medical inspectors are appointed in some of the cities by the boards of health and in others by the school committees. After watching the operation of the two systems for more than a year under the state law, Secretary George H. Martin of the state board of education writes:*

"The movement now in progress, which has reached different stages in different countries, seems to be shaping itself so as to include as necessary features the following elements:

"(1) Physicians. A sufficient number of trained physicians to carry on the necessary examinations and exercise the needed oversight of all the children in the public and private schools, these physicians to act under the direction of the local educational authority, but in co-operation with local health authorities. In the larger cities the physicians should act under the immediate direction of a chief medical officer, who should be a permanent member of the educational staff."

SUMMARY.—In summing up, then, we may conclude as a result of the evidence presented:

1. The detection of contagious diseases in the schools, involving daily visits by physicians and the power of the law, is in the nature of an extension of the powers heretofore exercised by boards of health; and where medical inspection is to include nothing more than this work, systems may well be administered by boards of health, if care be taken to establish and maintain sufficiently close and friendly relations with the school officials.

2. Those activities which have to do with the child's physical condition and the hygiene of school work—seating, exercise, hours of home study—that is to say, all functions of the medical inspection of schools except those pertaining to contagious diseases,

* Massachusetts State Board of Education, 71st Annual Report, 1906–07, p. 123.

are, in the nature of the case, an integral part of school interests and must not be divorced from them. Moreover, the records of the examination of school children for physical defects likely to interfere with proper growth and education must, if they are to serve their end, follow the child from grade to grade and from school to school, and each case must be followed up constantly; that is, they are an important part of the school records and must be so made and administered.

In brief:

(a) Medical inspection for the detection of contagious diseases may well be a function of the board of health.

(b) Physical examinations for the detection of non-contagious defects should be conducted by the educational authorities, or at least with their full co-operation, because they are made for educational purposes.

(c) The records of physical examinations must be constantly and intimately connected with school records and activities.

(d) They do not need to be connected with other work of the board of health.

CHAPTER XI

PHYSICAL DEFECTS AND SCHOOL PROGRESS

THE literature of the newer school hygiene contains many references to the close relation between physical defectiveness and school retardation. Unfortunately, however, few investigations have been conducted to find out just what relation exists between progress and the physical condition of the pupil, and the published reports of such investigations as have been carried on are meager and unsatisfactory.

Six American studies bearing on the problem are sufficiently significant to warrant review. The first of these was an investigation carried on by Dr. Walter S. Cornell and reported in the *Psychological Clinic* for January, 1908.*

Defects Among "Exempt" and "Non-Exempt" Children

In Philadelphia, where Dr. Cornell's work was done, the pupils were divided into so-called "exempt" children, those whose work had been so thoroughly satisfactory that they were advanced to higher grades without examination, and "non-exempt," those whose work was less satisfactory. Among 1,594 children in five schools who were given physical examinations, he found the following:

TABLE 35.—PER CENT OF CHILDREN EXAMINED FOUND DEFECTIVE, AMONG 907 "EXEMPT" AND 687 "NON-EXEMPT" CHILDREN, IN PHILADELPHIA, PENN.

	Exempt children	*Non-exempt children*
Number examined	907	687
Per cent defective	28.8	38.1

*Cornell, Walter S., M.D.: The Relation of Physical to Mental Defect in School Children. *Psychological Clinic*, Jan. 15, 1908, pp. 231–234.

Here the figures show that the percentage of defectives is much higher among the non-exempt than among the exempt children. We are given no details, however, as to defects found and so no data indicating which particular sort or sorts of defects caused the preponderance on the side of the non-exempt pupils. Some light, however, seems to be thrown on this problem by the results of an investigation conducted in 1908 by Dr. S. W. Newmayer in the schools of Philadelphia* and covering the examinations of 5,005 children, of whom 3,587 were exempt and 1,418 non-exempt. Defects were found among them as follows:

TABLE 36.—PHYSICAL DEFECTS AMONG 3,587 EXEMPT AND 1,418 NON-EXEMPT CHILDREN, IN PHILADELPHIA, PENN., 1908

Defect	Cases among		Cases per 100 children among	
	Exempt children	*Non-exempt children*	*Exempt children*	*Non-exempt children*
Defective vision	371	171	10	12
Defective hearing	49	29	1	2
Defects of nose	54	21	2	2
Defects of throat	137	53	4	4
Orthopedic defects	25	25	1	2
Mentally defective	6	80	..	5
Skin disease	918	423	26	30
Miscellaneous	214	128	6	9
Total	1,774	930	50	66

With two exceptions the defects are distributed between the two classes of children with surprising equality.

The brighter pupils seem to be afflicted in about the same degree as their duller companions. The two exceptions occur in the cases of "mental defects" and "skin diseases," both of which are more frequent among the duller children. That the former should be more common is to be expected. That the non-exempt children should be found to suffer more commonly from skin diseases is probably a reflection of poorer home conditions rather than a cause of their lower school standings.

* Report not in print.

Defects Among Normal and Over-Age Children

In 1906 Superintendent James E. Bryan of Camden conducted an extensive study* of the relation between school progress and physical condition. In all, 10,130 children were given physical examinations. Of these children, 8,110 were of normal age and 2,020 retarded. The results of the vision and hearing tests were as follows:

TABLE 37.—DEFECTS OF VISION AND HEARING AMONG 8,110 NORMAL AND 2,020 RETARDED CHILDREN IN CAMDEN, N. J., 1906

	Children of normal age	*Retarded children*
Number examined	8,110	2,020
Per cent having defective vision	27	29
Per cent having defective hearing	4	6

From these data one would hesitate to draw conclusions as to any relation between retardation and defective vision and would feel doubtful with regard to defective hearing.

Among the children studied 1,852 had failed of promotion. These children were given still further examinations. Among them 1,279 were of normal age for their school grade and 573 were retarded. The results of the examinations were as follows:

TABLE 38.—PHYSICAL DEFECTS AND IRREGULAR ATTENDANCE AMONG 1,279 NORMAL AND 573 RETARDED CHILDREN WHO FAILED OF PROMOTION IN CAMDEN, N. J., 1906

	Children of normal age	*Retarded children*
Number examined	1,279	573
Per cent having defective vision	51	40
Per cent having defective hearing	14	11
Per cent having bad health	21	21
Per cent attending irregularly	30	46

*Annual Report of the Board of Education of the City of Camden, New Jersey, 1907, pp. 81–120.

About 10 per cent of the school children of our cities suffer from malnutrition.

These data furnish still further surprises. The children of normal age actually show higher percentages of defective vision and hearing than do the retarded ones, and the significant feature disclosed seems to be that irregular attendance rather than physical defects is the important factor affecting school progress.

Defects Among Promoted and Non-Promoted Children

In his report for 1910 (page 37), Superintendent Verplanck of South Manchester, Connecticut, reports results of physical examinations among 1,396 children, of whom 1,093 were promoted at the end of the year and 303 failed of promotion. The findings are as follows:

TABLE 39.—PHYSICAL DEFECTS AMONG 1,093 CHILDREN PROMOTED AND 303 CHILDREN NOT PROMOTED IN ELEMENTARY SCHOOLS, IN MANCHESTER, CONNECTICUT, 1910

Defect	Cases among children		Cases per 100 children among those	
	Promoted	*Not promoted*	*Promoted*	*Not promoted*
Teeth	272	116	25	38
Throat	156	39	14	13
Adenoids	162	61	15	20
Eyes	41	9	4	3
Other defects	23	8	2	3
Total	654	233	60	77

These figures show that a greater percentage of the non-promoted than of the promoted pupils had adenoids and defective teeth. In the case of the other defects the difference in the figures is so slight as to be non-significant.

Defects Among Retarded Children

In his report for 1909–10 (page 28), Superintendent D. C. Bliss of Elmira, New York, reports the results of the physical examinations among 449 children who had been in the first grade of the Elmira schools for from two to seven years. The findings are presented in Table 40.

TABLE 40.—PHYSICAL DEFECTS AMONG 449 RETARDED CHILDREN, OF WHOM 345 HAD BEEN IN THE FIRST GRADE TWO YEARS, 86 THREE YEARS, AND 18 FOUR OR MORE YEARS. ELMIRA, NEW YORK, 1909–10

Defect	Cases among children			Cases per 100 children among those		
	2 years in grade	*3 years in grade*	*4 or more years in grade*	*2 years in grade*	*3 years in grade*	*4 or more years in grade*
Adenoids	67	18	9	19	21	50
Hypertrophied tonsils	141	25	9	41	29	50
Anemia	52	15	5	15	17	28
Enlarged glands	77	19	6	22	22	33
Defective vision	72	21	5	21	25	28
Defective hearing	17	3	1	5	3	6
Rachitis	38	19	4	11	22	22
Total	464	120	39	134	139	217

A study of the figures of the last three columns shows in general an increase in the percentage of defects found as we pass from the pupils who had been in the first grade two years to those who had been there three years and to the most retarded group who had been there from four to seven years. This increase of defects with progressive retardation is particularly evident in the case of the pupils who had adenoids or were anemic.

DEFECTS AND PROGRESS IN NEW YORK

In a study of retardation in the New York public schools, conducted in 1908 by the Russell Sage Foundation, a careful tabulation was made of the records of the physical examinations of 7,608 children who had been examined by school physicians. When these records were tabulated the astonishing condition was brought to light that nearly 80 per cent of the children who were of normal age for their grades were found to have physical defects, while only about 75 per cent of the retarded children were defective.

Another noteworthy point was that the percentage of defective children in the lower grades was decidedly greater than in the upper grades. The discovery of these unlooked-for results led

to further study of the figures. The data were retabulated by ages, and the findings showed a marked and consistent falling off of children who had each sort of defect from the age of six up to the age of fifteen. Defective vision alone increased slowly but steadily with advancing age.

Moreover, these decreases were not due to the falling out or leaving school of children suffering from defects. This might be put forward as an explanation if we had to do with children above the age of compulsory attendance, or if the characteristic decrease did not take place until the age of fourteen or fifteen; but such was not the case. The children were from six to fifteen years of age, and the marked decrease began with the seven, eight, nine, and ten-year-old children and continued steadily.

Were further data not available, it would be difficult to explain the seeming anomaly that retarded children have fewer defects than do children of normal age; but the data showing the decrease of physical defects with increasing age are illuminating. It is evident that here age is the important factor. The importance of this factor in all investigations into the influence of physical defects on school progress is evident.

Whether the term "retarded," referring to over-age children, is used to express a condition or an explanation, it will always follow from the definition itself that retarded children will be older than their fellow pupils in the same grades. In all cases it will always be true that the "backward" pupils will be the older pupils. Now, the older pupils are found to have fewer defects. This is true whether they are behind their grades or well up in their studies. Therefore, it is not surprising that we find 80 per cent of all children of normal age have physical defects more or less serious, while but 75 per cent of the retarded children are found to be defective. This does not mean that pupils with more physical defects are brighter mentally. It simply means that those who are above normal age are older, and that older pupils have fewer defects.

In order to ascertain what correlation may exist between physical defects and school progress, the records of the children were retabulated, using age instead of grade as a basis, so that the findings should not be vitiated by the heterogeneous age composition of the grades.

The children were arbitrarily divided into dull, normal, and bright groups, using as a standard, age in grade. For instance, it was considered that the eleven-year-old child in the first grade may as a rule be safely classed as dull, whereas the ten-year-old child in the sixth or seventh grade may safely be considered bright. Using the age-in-grade criterion as a basis, the records of the ten, eleven, twelve, thirteen, and fourteen-year-old children were retabulated and assigned to the dull, normal, and bright classes. Results are shown in Table 41.

TABLE 41.—PER CENT OF DULL, NORMAL, AND BRIGHT PUPILS SUFFERING FROM EACH SORT OF DEFECT. AGES TEN TO FOURTEEN, INCLUSIVE. ALL GRADES. NEW YORK, 1908

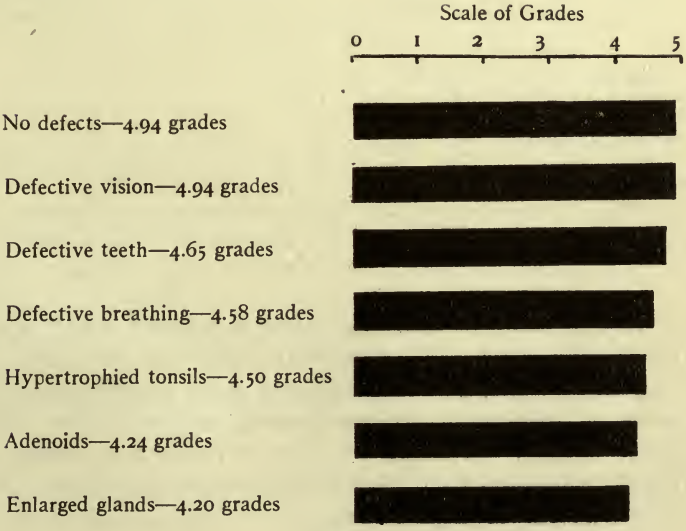
Defect	*Dull*	*Normal*	*Bright*
Enlarged glands	20	13	6
Defective vision	24	25	29
Defective breathing	15	11	9
Defective teeth	42	40	34
Hypertrophied tonsils	26	19	12
Adenoids	15	10	6

Here we have figures which demonstrate that there is a real relation between physical defectiveness and school progress. In each case, save that of vision, a larger per cent of the dull pupils is found to be defective than is the case among the normal pupils, and these again are more defective than the bright pupils. The fact that defective vision does not follow this same rule is somewhat difficult of explanation. There can be no question that seriously defective vision constitutes a real handicap to the progress of the child. On the other hand, it has long been a matter of common observation that the brightest and most studious pupils are often afflicted with defective eyesight. It may very well be that these two factors somewhat more than counterbalance each other. That is to say, while defective vision is undoubtedly a real handicap and is the cause of backwardness among some children, there are found in the same classes unusually bright children who have so injured their eyesight through undue strain and use that they too have very defective vision. This

explanation cannot be put forward as conclusive for there are no data to substantiate it. It seems, however, a reasonable explanation and one which coincides with the known facts in the case.

TABLE 42.—AVERAGE NUMBER OF GRADES COMPLETED BY PUPILS HAVING NO PHYSICAL DEFECTS COMPARED WITH NUMBER COMPLETED BY THOSE SUFFERING FROM DIFFERENT DEFECTS. CENTRAL TENDENCY AMONG 3,304 CHILDREN, AGES TEN TO FOURTEEN YEARS, IN GRADES ONE TO EIGHT. NEW YORK, 1908

Defect	*Average number of grades completed*
No defects	4.94
Defective vision	4.94
Defective teeth	4.65
Defective breathing	4.58
Hypertrophied tonsils	4.50
Adenoids	4.24
Enlarged glands	4.20



The results shown in Table 41 (page 158) indicate that there is a distinct relation between progress and physical defects. They do not, however, show what the relation is in terms of any given units. They do not show how many more grades are completed by the non-defective than by the defective child. In order to arrive at such a measure new computations were made showing the average number of grades completed by the ten-year-old pupils, by the eleven-year-old pupils, and so on for each of the other ages. The central tendency of all of these sets of results was then computed. The findings are shown in Table 42 and the diagram which follows.

The notable feature of the table is the fact that in every case, except that of defective vision, the children suffering from each sort of physical defect made less progress in their school work than did those not so handicapped. The seriousness of these handicaps in terms of percentages is shown in Table 43.

TABLE 43.—EXTENT TO WHICH CHILDREN SUFFERING FROM EACH SORT OF PHYSICAL DEFECT SHOW SLOWER PROGRESS THAN DO CHILDREN WITH NO DEFECTS. NEW YORK, 1908

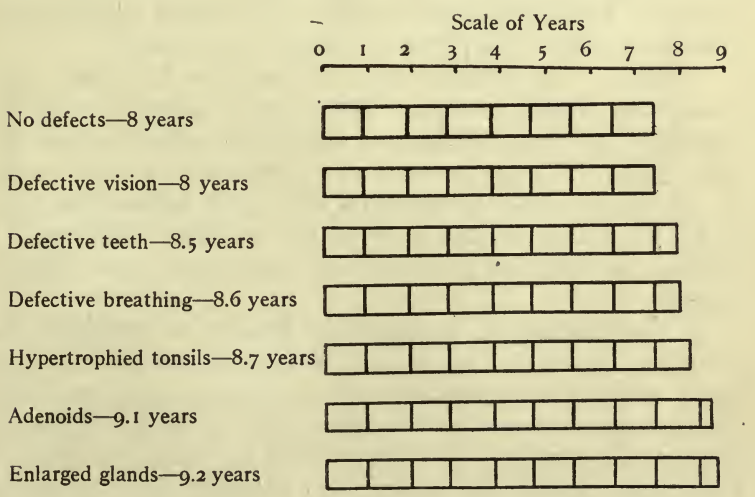
Defect	*Per cent of loss in progress*
Defective vision	..
Defective teeth	6
Defective breathing	7
Hypertrophied tonsils	9
Adenoids	14
Enlarged glands	15
Average	9

In this table the average loss of 9 per cent which appears in the last line is not the numerical average of the percentages of loss corresponding to the different sorts of defects, but the general loss of progress discovered among all the children having physical defects. In other words, the children suffering from physical defects made on the whole 9 per cent less progress than did those having no physical defects.

In order to show more definitely in terms of school progress just what these handicaps mean we may apply them to the cases of hypothetical non-defective and defective children. If we assume that the average child without physical defects of any kind will complete the eight grades in just eight years, how long will it take defective children to complete eight grades? The answer to this question may be found in Table 44 and the accompanying diagram.

TABLE 44.—NUMBER OF YEARS REQUIRED BY DEFECTIVE AND NON-DEFECTIVE CHILDREN TO COMPLETE THE EIGHT GRADES. NEW YORK, 1908

Defect	*Years required to complete eight grades*
No defects	8.0
Defective vision	8.0
Defective teeth	8.5
Defective breathing	8.6
Hypertrophied tonsils	8.7
Adenoids	9.1
Enlarged glands	9.2



If these figures are substantially significant for all New York City school children, their educational and economic import is great. According to the data, the child with seriously defective teeth requires half a year more than a non-defective child to complete the eight grades. About one-half of the children have seriously defective teeth. The handicap imposed by defective breathing means six-tenths of a year. About one child in seven has defective breathing. The child with hypertrophied tonsils takes about seven-tenths of a year more than he should. About one child in every four has hypertrophied tonsils. The extra time required by the child with adenoids is about one and one-tenth years. About one child in eight has adenoids. The pupil with enlarged glands requires one and two-tenths years extra. Nearly half of the children have enlarged glands.

The sums of money spent annually by New York City for public education reach high into the millions. It would be a simple matter to compute how many dollars are wasted each year in the futile attempt to impart instruction to pupils whose mental faculties are dulled through remediable physical defects. Roughly speaking, about 60 per cent of all the children suffer from such defects. If, then, we should show that the instruction given these children suffers a loss in effectiveness of nearly 10 per cent because of remediable physical defects, it is evident that the direct financial bearing of the problem is of great significance.

Such a computation, while it would undoubtedly prove interesting, is perhaps better left unmade because we do not know that the data discussed are either truly reliable or generally representative. They are based on a comparatively small number of cases in one city, in one year, and could similar data be secured for longer periods of time and in more localities it is not only possible but probable that they would show different results.

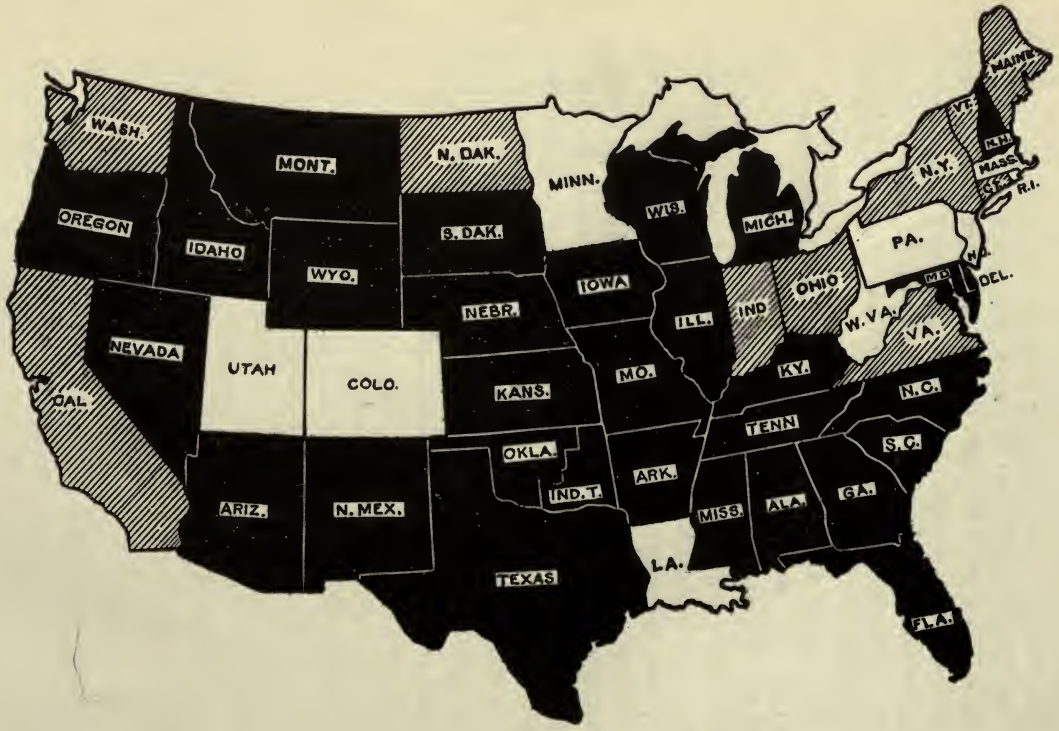
The examination is important because it establishes the principle that, except in the case of vision, older children have fewer defects. It shows that when children who are badly retarded are compared with normal and very bright children in the same age groups, the children rated as "dull" are found to have higher percentages of each sort of defect than the normal

and bright children. In this generalization defective vision must be excepted.

Moreover, the investigation gives us quantitative measures of the retarding forces of the different kinds of defects. In general, children suffering from physical defects are found to make about 9 per cent less progress than children having no physical defects. The figures do not really show the retarding influence of each sort of defect separately for the reason that the same child is often suffering from several sorts of defects.

Because of the reasons that have been mentioned, the figures may be accepted as having distinct value in revealing general tendencies, but must not be interpreted as showing with precision the relative retarding force of each separate sort of defect, or even of physical defectiveness in general.

Before the attempt to draw detailed and final conclusions on this subject is made, a series of similar investigations covering large numbers of children in different cities should be conducted, and the results carefully analyzed and compared. Until some such program has been carried out, dogmatic statements making general application of partial results should be avoided, and the tentative character of all conclusions thus far formulated, clearly recognized.



MEDICAL INSPECTION LAWS, 1912

States having mandatory laws in white, those having permissive laws cross hatched, and those having no laws black

CHAPTER XII

LEGAL PROVISIONS

THE first state law concerning the medical inspection of school children appears to have been passed by Connecticut in 1899. It did not provide for the complete sort of inspection now carried on in many cities and states, but only for the testing of eyesight by teachers every three years. Complete medical inspection, with examinations for the detection of physical defects, was first provided for by state enactment in the permissive law of New Jersey passed in 1903. This was followed by the mandatory law of Massachusetts, in 1906, which has been several times amended and has served as the basis for a majority of the bills which have since been presented in other state legislatures.

By the beginning of the year 1912, as has been stated, seven states had mandatory laws, 10 permissive ones, and in two states (Louisiana and Minnesota) and the District of Columbia medical inspection was carried on under regulations promulgated by the boards of health and having the force of law. The accompanying map shows graphically which states have mandatory laws, which permissive ones, and in which there are no laws at all.

The past five years have furnished a large body of experience gained under varying conditions in widely separated localities. The lessons of this experience can be read in the substantial agreement of a majority of the laws in several salient features. This agreement is graphically shown by the tabular presentation of the principal features of the laws and regulations on page 166.

On four points there is substantial agreement. The first is that the administration of the provisions of the law is placed in the hands of the school authorities. The second, third, and fourth are respectively the placing of inspection for contagious diseases, physical examination, and inspection of teachers, janitors, and buildings in the hands of school physicians. In seven cases provision is made for vision and hearing tests by teachers.

TABLE 45.—PRINCIPAL FEATURES OF STATE LAWS AND REGULATIONS PROVIDING FOR MEDICAL INSPECTION. 1911 [a]

No.	State	Date adopted	Permissive or mandatory	Administered by school or health authorities	Inspection by doctors for contagious diseases	Physical examinations by doctors	Inspection of teachers, janitors and buildings by doctors	Sight and hearing tests by teachers	Normal pupils trained in tests of sight and hearing	Provision for employment of nurses	Penalty for violation of law	Parents compelled to remedy condition discovered
1	California	1909	P	S	..	..	..	..	..	..	..	..
2	Colorado	1909	M	S	..	..	..	x	..	..	..	..
3	Connecticut	1907	P	S	x	x	x	..	..	..	..	..
4	District of Columbia	1907	M	H	x	..	x	..	..	x	..	..
5	Indiana	1911	P	S	x	x	x	x	..	..	x	..
6	Louisiana	1911	M	S	..	..	..	..	..	..	..	..
7	Maine	1909	P	S	x	x	x	x	..	..	..	..
8	Massachusetts	1906	M	S or H	x	x	x	x	x	..	..	..
9	Minnesota	1910	M	H	x	x	x	x	x	..	..	..
10	New Jersey	1909	M	S	x	x	..	..	..	..	..	x
11	New York	1910	P	S	..	..	..	..	..	..	..	..
12	North Dakota	1911	P	S	..	x	..	..	..	..	..	..
13	Ohio	1910	P	S	x	..	x	..	..	x	..	..
14	Pennsylvania	1911	M	S	x	x	x	..	..	x	..	..
15	Rhode Island	1911	M	S	x	x	x	x	..	..	..	..
16	Utah	1911	M	S	..	x	..	x	..	..	..	..
17	Vermont	1910	P	S	x	..	..	..	..	..	..	..
18	Virginia	1910	P	S	..	..	..	..	..	..	..	..
19	Washington	1909	P	S	x	..	x	..	..	..	..	..
20	West Virginia	1911	M	S	x	x	x	..	..	x	..	..

[a] x indicates the states which have the type of inspection named.

A clear idea of the principal provisions of the different laws may be gained from the following abstract:

Abstract of Laws and Regulations Covering Medical Inspection

1. California
   - Adopted 1909. Permissive. Applies where adopted
   - Administered by school authorities
   - Provides for health and development supervision of teachers and pupils
   - Inspectors may be either physicians or educators
2. Colorado
   - Adopted 1909. Mandatory. Applies to all public schools
   - Administered by school authorities
   - Teachers or principals test sight, hearing and breathing of all pupils annually
   - School authorities report to parents mental, moral or physical defectiveness discovered
   - Enforcement by State Bureau of Child and Animal Protection
3. Connecticut
   - Adopted 1907. Permissive. Applies where adopted
   - Administered by school authorities
   - Physicians inspect children for contagious diseases
   - Physicians may examine teachers, janitors and school premises
   - Physicians conduct sight, hearing and physical examinations annually
   - Defects reported to parents
   - School authorities may appoint school nurses
4. District of Columbia
   - Regulations of health officer and board of education
   - Adopted in present form in 1907. Mandatory. Applies to all public schools
   - Administered by health authorities
   - Physicians examine for contagious diseases
   - Physicians examine sanitary conditions of buildings
   - Physicians may examine teachers and janitors
5. Indiana
   - Adopted 1911. Permissive. Applies where adopted
   - Administered by school authorities
   - Physicians inspect children for contagious diseases

Teachers may test sight and hearing annually
Physicians conduct physical examinations
Defects reported to parents
Not more than 2,000 children for one physician
Compensation of physician not less than $5.00 for each school month
Physicians may examine teachers, janitors and buildings
If parents are too poor to provide necessary medical treatment it shall be paid for from public funds
Penalty of $5.00 to $50.00 for violation of provisions of act

6. Louisiana

Adopted 1911. Regulations of sanitary code of state board of health having force of law. Mandatory. Applies to all public schools
Administered by school authorities
Principal of each school makes monthly report on physical condition of children and sanitary condition of buildings on blanks furnished by state board of health
Principals and teachers exclude children suffering from contagious disease

7. Maine

Adopted 1909. Permissive. Applies to cities and towns of less than 40,000
Administered by school authorities
Not more than 1,000 pupils to a physician
Physicians inspect children for contagious diseases
Physicians may examine teachers, janitors and buildings
Tests of sight and hearing annually by teachers or physicians
Physical examination annually by physicians
Defects reported to parents

8. Massachusetts

Adopted 1906; amended 1910. Mandatory. Applies to all public schools
Administered by school or health authorities
Physicians inspect children for contagious diseases
Physicians may examine teachers, janitors and buildings
Tests of sight and hearing made by teachers annually
Physicians make physical examinations of children annually

Defects reported to parents
Normal schools train students in testing sight and hearing
Physicians conduct examinations of minors applying for age and schooling certificates

9. Minnesota
Regulations of board of health having force of law
Adopted 1910. Mandatory. Applies to all public schools
Administered by health authorities
Physicians examine for contagious diseases
Physicians may inspect teachers, janitors, and buildings
Physicians conduct physical examinations annually
Defects reported to parents
Teachers test sight and hearing annually
Normal schools train pupils in testing sight and hearing

10. New Jersey
Adopted 1909. Mandatory. Applies to all public schools
Administered by school authorities
Physicians examine for contagious diseases
Physicians conduct physical examinations, including sight and hearing tests
Defects reported to parents
Physicians deliver hygiene lectures to teachers
Parents and guardians may be proceeded against as disorderly persons for failure to remove any pathological condition which may cause a child's exclusion from school

11. New York
Adopted 1910. Permissive
Authorizes school authorities to expend school funds for the support of medical inspection

12. North Dakota
Adopted 1911. Permissive. Applies where adopted
Administered by school authorities
Physicians conduct physical examinations annually
Defects reported to parents
Co-operates with board of health to curb contagious disease and to secure treatment for indigent children

13. Ohio
    Adopted 1910. Permissive. Applies to cities
    Administered by school authorities, but powers may be delegated to health authorities
    Physicians inspect children and schools
    School nurses may be employed
14. Pennsylvania
    Adopted 1911. Mandatory in districts of first and second class. Permissive in districts of third and fourth class. Districts of first class are those of more than 500,000 population, second class from 30,000 to 500,000, third class 5,000 to 30,000 and fourth class less than 5,000
    Administered by school authorities
    Physicians conduct complete physical examinations of children annually
    Physicians make sanitary inspection of school premises annually
    In districts of fourth class medical inspectors are appointed by state commissioner of health
    Provision for employment of graduate nurses
15. Rhode Island
    Adopted 1911. Mandatory with permissive clause providing for employment of physicians
    Administered by school authorities
    Physicians, where employed, make annual examination of pupils, teachers, and janitors in public and private schools, and inspect buildings and surroundings
    Annual vision and hearing tests by physicians or teachers
    Defects reported to parents
16. Utah
    Adopted 1911. Mandatory. Applies to all public schools
    Administered by school authorities
    Teachers or physicians examine all children annually for defects of sight or hearing, defective teeth or mouth breathing
    Defects reported to parents
17. Vermont
    Adopted 1910. Permissive. Applies where adopted
    Administered by school authorities

Typical adenoid faces showing mouth breathing, flattened noses, and protruding eyes.

Physicians inspect pupils as provided by rules of state board of health
On request, physicians examine pupils of private schools

18. VIRGINIA
Adopted 1910. Permissive. Applies where adopted
Administered by school authorities
Authorizes school boards to support systems of medical inspection

19. WASHINGTON
Adopted 1909. Permissive. Applies to cities of first class
Administered by school authorities
Authorizes school boards to appoint medical inspectors who shall report monthly on health conditions in each school

20. WEST VIRGINIA
Adopted 1911. Mandatory in cities, permissive in country districts
Administered by school authorities
Physicians inspect children for contagious diseases
Physicians conduct physical examinations annually
Physicians, on request of board, report on lighting, ventilation, etc.
School nurses may be employed

PROVISIONS NEW LAWS SHOULD INCLUDE

A comparative study of the provisions of the different laws shows that with the added experience gained through knowledge of how the older measures have met the test of time, school physicians and educators have incorporated in some of the more recent measures features which are genuine improvements, and which should be provided for in bills for new medical inspection acts and for amendments of the old ones. The following are the features which it would seem ought to be included in bills for new medical inspection laws:

1. A provision that the administration of the system of medical inspection shall be in the hands of the school authorities, but that they shall have the power to delegate their authority to the local health officials, and that in the treatment of cases of contagious diseases the school and health authorities shall co-operate.

The principle here involved is that routine medical inspection and physical examinations are primarily established to insure the health and vitality of the individual child and are preferably conducted by the school authorities who are charged with his daily care. The curbing of epidemics of contagious disease is primarily for the protection of the community, and in this the health authorities have the right as well as the duty to intervene. Examples of such provisions as those suggested are to be found in the laws of North Dakota and Ohio.

2. Provision for inspection by school physicians to detect and exclude cases of contagious disease.

3. Provision for annual examinations of all children by school physicians to detect any physical defects which may prevent the children from receiving the full benefit of their school work or which may require that the work be modified to avoid injury to them.

This second provision should include the requirement that parents be notified of any defects discovered.

4. Provision that annual tests of vision and hearing shall be conducted by the teachers.

This provision was adopted by Massachusetts on the advice of the specialists in these fields and its wisdom has been demonstrated by extensive experience in that state.

5. Provision that the school physicians may conduct examinations of teachers and janitors and shall make regular inspections of the buildings, premises, and drinking water to insure their sanitary condition.

6. Provision that pupils in normal schools shall receive training in conducting vision and hearing tests.

This requirement is found in the Massachusetts law and the Minnesota regulations.

7. Provision for the employment of school nurses.

This is provided for in the laws of Connecticut, Ohio, Pennsylvania, and West Virginia.

8. Provision for the enforcement of the law.

Such provisions, not very well developed, are found in the laws of Colorado, Indiana, and New Jersey. The nature of the

provision must vary with local conditions. In states where municipalities receive a large part of their school funds from the state, and where their school policies are consequently largely controlled through the state board of education, it seems clear that the enforcement of the law should be placed in the hands of that body.

The most authoritative formulation of the features which should be included in acts providing for the medical inspection of schools is that embodied in a series of resolutions adopted by the state and provincial boards of health at their annual meeting held in Los Angeles, California, from June 30 to July 1, 1911. This body has for some years had a standing committee on medical inspection legislation and has devoted much time to the study of the problem; and each year, for the past three years, has made reports of progress at the annual conference. The resolutions adopted in 1911 are as follows:

RESOLUTIONS ADOPTED BY THE CONFERENCE OF STATE AND PROVINCIAL BOARDS OF HEALTH, LOS ANGELES, JUNE 30–JULY 1, 1911

We endorse legislation providing for the medical inspection of schools, because extended and varied experience has demonstrated that efficient medical inspection betters health conditions among school children, safeguards them from disease, renders them healthier, happier and more vigorous, and aims to insure for each child such physical and mental vitality as will best enable him to take full advantage of the free education offered by the state.

It is our judgment that every law providing for the medical inspection of schools should make provision for frequent inspections of the children by duly qualified school physicians to detect and exclude cases of contagious disease.

It should further provide for annual physical examinations of all the children by school physicians to detect any physical defects which may prevent the children from receiving the full benefit of their school work or which may require that the work be modified to avoid injury to the child.

It should empower school physicians to conduct examinations of teachers and janitors and to make regular inspections of buildings, premises and drinking water to insure their sanitary condition.

We endorse the school nurse as a most valuable adjunct of medical inspection and believe that provision for the employment of school nurses should be included in each law.

THE MASSACHUSETTS LAW AND THE ENGLISH ACT

There are two medical inspection laws which are more important than any of the others as typifying the legislative enactments under which the views and beliefs and the results of experience of educators and physicians have been crystallized in Europe and America in the field of medical inspection of schools. These two laws are the English statute which became effective on January 1, 1908, and that of the state of Massachusetts. This commonwealth, always foremost in pioneer and progressive legislation, placed upon its statute books in 1906 mandatory laws far more comprehensive in their provisions than the English laws. In view of the fact that these two laws have served as the basis for most of the bills which have since been presented in other state and national legislatures, it seems worth while to quote them in full here with some comment on their similarity and differences.

The English Law

The English law, known legally as Section 13 of the Administrative Provisions of the Education Act of 1907, in its entirety is as follows:

"13. (1) The powers and duties of a local education authority under Part III of the Education Act, 1902, shall include: (a) Power to provide for children attending public elementary schools, vacation schools, vacation classes, play centers, etc. (b) The duty to provide for the medical inspection of children immediately before or at the time of or as soon as possible after their admission to a public elementary school, and on such other occasions as the Board of Education direct, and the power to make such arrangements as may be sanctioned by the Board of Education for attending to the health and physical condition of the children educated in public elementary schools: Provided, that in any exercise of powers under this section the local education authority may encourage

and assist the establishment or continuance of voluntary agencies, and associate with itself representatives of voluntary associations for the purpose.

"(2) This section shall come into operation on the first day of January, nineteen hundred and eight."

The English lawmakers are not quite so verbose and prolix in statute drafting as are their American contemporaries, and the interpretation and construction of this short act was comprehensively treated by the Board of Education in a memorandum issued on November 22, 1907,* before the act became effective, for the guidance of the administrative officers charged with the execution of the statute.

This course differs somewhat from the American system. In the United States, the construction and interpretation of statutes are left finally to the courts. This procedure is a lengthy and involved process. In view of the fact that the memorandum of the English education authorities referred to has the practical effect of a parliamentary enactment in the execution of the law, it may be well to quote from it somewhat extensively.

In stating the scope and purpose of the act the memorandum uses the following words:

"The Board desire therefore at the outset to emphasize that this new legislation aims not merely at a physical or anthropometric survey or at a record of defects disclosed by medical inspection, but at the physical improvement, and, as a natural corollary, the mental and moral improvement, of coming generations. The broad requirements of a healthy life are comparatively few and elementary, but they are essential, and should not be regarded as applicable only to the case of the rich. In point of fact, if rightly administered, the new enactment is economical in the best sense of the word. Its justification is not to be measured in terms of money but in the decrease of sickness and incapacity among children and in the ultimate decrease of inefficiency and poverty in after life arising from physical disabilities."

A further statement which concludes the same section of the memorandum is as follows:

* Board of Education of Great Britain. Memorandum on Medical Inspection of Children in Public Elementary Schools, Circular 576.

"It is founded on a recognition of the close connection which exists between the physical and mental condition of the children and the whole process of education. It recognizes the importance of a satisfactory environment, physical and educational, and, by bringing into greater prominence the effect of environment upon the personality of the individual child, seeks to secure ultimately for every child, normal or defective, conditions of life compatible with that full and effective development of its organic functions, its special senses and its mental powers which constitutes a true education."

It will be observed that the burden of executing the provisions of the statute is specifically laid upon the education authorities. This is a distinct departure from the established course heretofore pursued in matters relating to the public health. In the view of the English Board of Education, however, the present act is not intended to supersede the powers which have long been exercised by sanitary authorities under various public health acts, but is meant to serve rather as an amplification and a natural development of previous legislation. In order that friction between the education and health authorities may be avoided, if possible, the board of education in this memorandum advises a thorough and friendly co-operation with such authorities in the administration of the law.

The second most noticeable feature about the act is that it makes medical inspection compulsory. Theretofore, medical inspection had been more or less in vogue in various localities under the supervision of the education authorities, sometimes in conjunction with the health authorities. The central authority for the execution of the law is the board of education. The instruments of the board are the local education authorities. In country areas this local authority is the county council. It is suggested in the memorandum that the county council instruct the county medical officer to advise the education committee and to supervise the new work. It is also suggested that the county medical officer have an assistant appointed by the county council, whose duty shall be the inspection provided for by the statute.

In county boroughs the town council, which is at the same time the local authority for public health and the local education

authority, is counseled to instruct their medical officer of health to advise the education committee and assume responsibility for the new work. Where no school medical officer has been appointed, it is suggested that his appointment be made by the education authorities. Where there are already school medical officers it is suggested that they be retained if competent and sufficient for the new duties.

Although there is no provision for school nurses in the act, the board of education advises that wherever practicable such nurses be employed.

The board decided that not less than three inspections during the school life of a child would be necessary to secure the results desired. In certain areas, the board may from time to time require inspection at shorter intervals and of a more searching character.

The inspection of the sanitation of school buildings, the prevention of the spread of contagious diseases, and the supervision of the personal and home life of the child are also suggested.

Finally, it should be observed that neither the act nor the memorandum contains any section whatever requiring that parents of school children found diseased or defective after such inspection shall be compelled to provide proper medical attention at the hands of their own physician or of the hospital authorities.* As a means of securing the co-operation of parents the memorandum recommends "that each local educational authority should encourage one or both of the parents of the child to be present at the first inspection, and to this end a notification should be sent to the parents as to the time and place at which it will take place."

The Massachusetts Law

Let us now consider for comparison with the English statute the first legislative enactment in the United States which made medical inspection mandatory. As this Massachusetts law was the initial legislative effort in America along this line, it seems worth while to quote it in extenso. Legally it is known as Chapter

* See Chap. VI, p. 86, for information regarding compulsory action taken in England.

502 of the Acts of 1906, and it became a law of the state of Massachusetts on the first day of September, 1906. It provides:

APPOINTMENT OF SCHOOL PHYSICIANS, ETC.

Section 1. The school committee of every city and town in the Commonwealth shall appoint one or more school physicians, shall assign one to each public school within its city or town, and shall provide them with all proper facilities for the performance of their duties as prescribed in this act: provided, however, that in cities wherein the board of health is already maintaining or shall hereafter maintain substantially such medical inspection as this act requires, the board of health shall appoint and assign the school physician.

EXAMINATION AND DIAGNOSIS TO BE MADE

Section 2. Every school physician shall make a prompt examination and diagnosis of all children referred to him as hereinafter provided, and such further examination of teachers, janitors, and school buildings as in his opinion the protection of the health of the pupils may require.

AUTHORITY OF SCHOOL COMMITTEES, ETC.

Section 3. The school committee shall cause to be referred to a school physician for examination and diagnosis every child returning to school without a certificate from the board of health after absence on account of illness or from unknown cause; and every child in the schools under its jurisdiction who shows signs of being in ill health or of suffering from infectious or contagious disease, unless he is at once excluded from school by the teacher; except that in the case of schools in remote and isolated situations the school committee may make such other arrangements as may best carry out the purposes of this act.

NOTICE TO BE SENT TO PARENT OR GUARDIAN

Section 4. The school committee shall cause notice of the disease or defects, if any, from which any child is found to be suffering to be sent to his parent or guardian. Whenever a child shows symptoms of smallpox, scarlet fever, measles, chickenpox, tuberculosis, diphtheria or influenza, tonsilitis, whooping cough, mumps, scabies, or trachoma, he shall be sent home immediately, or as soon as safe and proper con-

veyance can be found, and the board of health shall at once be notified.

TESTS OF SIGHT AND HEARING AND EXAMINATION FOR DISABILITY OR DEFECTS

Section 5. The school committee of every city and town shall cause every child in the public schools to be separately and carefully tested and examined at least once in every school year to ascertain whether he is suffering from defective sight or hearing or from any other disability or defect tending to prevent his receiving the full benefit of his school work, or requiring a modification of the school work in order to prevent injury to the child or to secure the best educational results. The tests of sight and hearing shall be made by teachers. The committee shall cause notice of any defect or disability requiring treatment to be sent to the parent or guardian of the child, and shall require a physical record of each child to be kept in such form as the state board of education shall prescribe.

STATE BOARD OF HEALTH TO PRESCRIBE DIRECTIONS: STATE BOARD OF EDUCATION TO FURNISH RULES, ETC.

Section 6. The state board of health shall prescribe the directions for tests of sight and hearing and the state board of education shall, after consultation with the state board of health, prescribe and furnish to school committees suitable rules of instruction, test cards, blanks, record books, and other useful appliances for carrying out the purposes of this act, and shall provide for pupils in the normal schools instruction and practice in the best methods of testing the sight and hearing of children. The state board of education may expend during the year nineteen hundred and six a sum not greater than fifteen hundred dollars and annually thereafter a sum not greater than five hundred dollars* for the purpose of supplying the material required by this act.

The English statute and the Massachusetts one are similar in that both make medical inspection compulsory, both place the administration in the hands of the educational authorities, and that neither provides for procedure against neglectful parents of defective children. They prescribe different methods of

*Eight hundred dollars now appropriated under Chapter 189, Acts of 1908.

securing the co-operation of parents for the correction of defects, the Massachusetts law requiring that notices of the results of inspections be sent, while the English memorandum recommends the summoning of parents to be present at the inspections. In the English statute there is no express provision as to the frequency of physical examinations, but as has been stated, the memorandum of the board of education prescribes three examinations as necessary during the school life of the pupil. In the Massachusetts statute an examination of every pupil at least once in every year for defective sight or hearing and any other physical disabilities, is provided for. The sight and hearing tests are given by teachers, while the other examinations are conducted by physicians.

These are the leading statutes of Europe and America on this subject. At the close of 1912 the American statute will have been in effect for six years and the English statute for five. Both of these pieces of legislation may therefore be considered as having passed through the experimental stage.

APPENDICES

APPENDIX I

SUGGESTIONS TO TEACHERS AND SCHOOL PHYSICIANS REGARDING MEDICAL INSPECTION

Issued by the Massachusetts Board of Education

COMMONWEALTH OF MASSACHUSETTS
STATE HOUSE, BOSTON, Jan. 23, 1907

In order to render the medical inspection required by chapter 502, Acts of 1906, effective and uniform throughout the State, His Excellency Governor Guild appointed a committee to prepare a circular of advice to the school physicians of the State.

This committee consisted of Dr. Henry P. Walcott, Dr. Charles Harrington and Dr. Julian A. Mead, representing the State Board of Health; Mrs. Ella Lyman Cabot, Mr. George I. Aldrich and Mr. George H. Martin, representing the Board of Education; and Dr. Robert W. Lovett, Dr. Harold Williams and Dr. W. H. Devine, representing the medical profession.

A sub-committee of this body arranged for conferences with the heads of departments and others connected with the medical schools and hospitals in and about Boston, and with physicians who have had experience in school inspection. These gentlemen have given freely of their time and thought, and have furnished to the committee the suggestions contained in this circular.

These suggestions cover the ground included in the clause in section 5 of the law: "The school committee of every city and town shall cause every child in the public schools to be separately and carefully tested and examined at least once in every school year, to ascertain whether he is suffering from defective sight or hearing, or from any other disability or defect tending to prevent his receiving the full benefit of his school work, or requiring a modification of the school work in order to prevent injury to the child or to secure the best educational results."

The Board of Education issues this circular in the assurance that it represents the highest professional authority in the specialties covered by the law, and commends it to the careful attention of all teachers, school physicians and other school officers.

The following are the subjects treated, with the names of the physicians who have contributed suggestions:

1. *Infectious Diseases.*—Dr. John H. McCollom.

2. *The Eye.*—Dr. Myles Standish, Dr. Henry B. Chandler, Dr. Charles H. Williams, Dr. David W. Wells.

3. *The Ear.*—Dr. Clarence J. Blake, Dr. D. Harold Walker.

4. *The Throat and Nose.*—Dr. Samuel W. Langmaid, Dr. Algernon Coolidge, Jr., Dr. Frederic C. Cobb, Dr. George B. Rice.

5. *The Skin.*—Dr. John T. Bowen, Dr. James S. Howe, Dr. George F. Harding, Dr. Charles J. White, Dr. C. Morton Smith, Dr. John L. Coffin.

6. *Diseases of Bones and Joints.*—Dr. Edward H. Bradford, Dr. Augustus Thorndike, Dr. Charles F. Painter, Dr. George H. Earl, Dr. Robert Soutter.

7. *Children's Diseases.*—Dr. Thomas M. Rotch, Dr. John L. Morse, Dr. John H. Moore, Dr. Robert W. Hastings, Dr. Edmund C. Stowell.

8. *The Teeth.*—Dr. Edward W. Branigan, Dr. George A. Bates, Dr. Eugene H. Smith, Dr. Samuel A. Hopkins.

9. *Nervous Diseases.*—Dr. James J. Putnam, Dr. George L. Walton, Dr. Morton Prince, Dr. William N. Bullard, Dr. Edward W. Taylor, Dr. John J. Thomas, Dr. Walter E. Fernald.

10. *School Hygiene.*—Dr. Henry J. Barnes.

11. *School Furniture.*—Dr. Frederick J. Cotton, Dr. R. Clipston Sturgis.

12. *School Inspectors.*—Dr. George S. C. Badger, Dr. H. Lincoln Chase, Dr. Harry M. Cutts.

GEORGE H. MARTIN,
Secretary.

DISEASES

INFECTIOUS DISEASES

Diphtheria.—It is a well-recognized fact that nasal diphtheria of a mild type without constitutional disturbance is one of the most important factors in causing the spread of the disease, and also that children very frequently have profuse discharges from the nose. It therefore follows that, in order properly to inspect the public schools, it is important that cultures should be taken from the nose in every case where there is a persistent discharge, particularly if there is any excoriation about the nostrils.

The throat should be examined at varying intervals, depending

upon the physical condition of the children. Any hoarseness or any thickness of the voice should cause an examination of the throat. If the tonsils are enlarged, if the mucous membrane is congested, if there is swelling of palate, a culture should be taken. These symptoms precede diphtheria.

A child with positive cultures should be excluded from school until two consecutive negative cultures at an interval of forty-eight hours have been obtained.

Scarlet Fever.—If there is a sudden attack of vomiting, if there is any redness of the throat, if the child complains of headache, if there is an unexplained rise in temperature, the child should be isolated at once. Any desquamation (peeling of the skin) should be looked upon with suspicion. If there are any breaks at the finger tips, if on pressing the pulp of the finger there is a white line at the juncture of the nail with the pulp of the finger, particularly if this occurs in the majority of the finger tips, the child should be excluded from the school.

A child who has had scarlet fever should not return to school until the process of desquamation has been entirely completed, and all discharge from the nose and ears has ceased.

Measles.—Running from the nose and slight intolerance of light may call for an examination of the mucous membrane of the mouth for Koplik's sign. Koplik's sign, so called, is the presence on the lining membrane of the mouth, near the molar teeth, of minute pearly white blisters, without any inflammation around them. There may be only two or three of these blisters, and they may easily escape detection if the patient is not carefully examined in a good light. These blisters are certain forerunners of an attack of measles.

No child should return to school after an attack of measles until the desquamation is entirely completed, and the child has recovered from the intercurrent bronchitis.

Mumps.—Any swelling or tenderness in the region of the parotid glands (situated behind the angle of the jaw) should be looked upon with suspicion. It is important to notice any enlargement or swelling about Steno's duct (inside the mouth, opposite the second upper molar tooth), as this is a very frequent symptom of mumps.

A child should be excluded from school until one week has elapsed after the disappearance of all swelling and tenderness in the region of the parotid glands.

Whooping-cough.—A persistent paroxysmal cough, frequently accompanied with vomiting, no matter whether there is any distinct whoop or not, is indicative of whooping-cough. In cases of whooping-cough of long standing, even if there has been no distinct whoop, an ulcer on

the band connecting the lower surface of the tongue with the floor of the mouth is found in a certain number of cases. If there is no distinct ulceration, there may be a marked congestion of the band.

As long as there is any cough, the child who has had whooping-cough should be looked upon with suspicion.

Varicella (*Chicken Pox*).—A few black crusts scattered over the body are evidences of an attack of chicken pox. The crusting seen in impetigo must be differentiated from that of chicken pox.*

No child should return to school until all crusts have disappeared from the body, particularly from the scalp, for in this region the crusts remain longer than elsewhere.

The Eyes

[Supplement to circular already issued †]

There are certain children who show normal vision by the ordinary tests, yet whose parents should be notified to have the eyes examined. These are: (1) children who habitually hold the head too near the book (less than twelve to fourteen inches); (2) children who frequently complain of headaches, especially in the latter portion of school hours; (3) children in whom one eye deviates even temporarily from the normal position.

It should be remembered that the following symptoms are at times indicative of trouble with the eyes: (1) habitual scowling, and wrinkling of the forehead when reading or writing; (2) twitching of the face; (3) inattention and slowness in book studies in a child otherwise bright.

The Ears

See circular of directions † for testing hearing, already in hands of teachers.

The Throat and Nose

In all cases of acute illness the throat should be examined for the presence of the eruption of scarlet fever and measles and for the exudation or membrane of tonsilitis and diphtheria, and a culture taken in any suspected case of the latter.

The presence of discharge from the nose should be noted, and if it is thick and creamy, a culture should always be taken. In all cases of severe hoarseness, with difficult breathing, diphtheria should be sus-

* See Diseases of the Skin.

† See pp. 45–47 for this circular.

pected. If the discharge from the nose is only from one nostril, a foreign body in the nose should be looked for.

In cases of chronic nasal obstruction, as evinced by mouth-breathing, snoring, continual post-nasal catarrh or recurring ear trouble, the presence of an adenoid growth (third tonsil) should be suspected, and the child referred for special examination and treatment. As a rule, digital examination for adenoids should be made only by the operating surgeon. Obviously large tonsils, recurring tonsilitis and enlargement of the glands of the neck, suggest the advisability of referring the child to the family physician as to the propriety of removing the tonsils.

Recurring nose-bleed should be referred for special treatment.

In cases of eczema about the nostrils, a cause may be sought in pediculi capitis (head lice).

In referring cases for treatment, school physicians, in addition to the diagnosis, should state the symptoms upon which the diagnosis is based, for the benefit of the family physician or specialist.

Diseases of the Skin

Scabies (*the Itch*).—A contagious skin disease, due to an animal parasite which burrows in the skin, causing intense itching and scratching. The disease usually begins upon the hands and arms, spreading over the whole body, but does not affect the face and scalp. Between the fingers, on the front of the wrist, at the bend of the elbows and near the arm-pits are favorite locations for the disease; but in persons of cleanly habits the disease may not show at all upon the hands, and its real nature is determined only after a most thorough and careful examination. There is a great variation in the extent and severity of this disease, lack of personal care and cleanliness always favoring its development. Scratching soon brings about an infection of the skin with some of the pus-producing germs, and the disease is then accompanied by impetigo, or a pus infection of the skin.

At the present time itch is very common and widespread, and, because of the great variation in its severity, mild cases have been mistaken for hives, eczema, etc., the real condition not being recognized, and the disease spread in consequence. All children who are scratching or have an irritation upon the skin should be examined for scabies.

It is very important that all infected members of a family be treated till cured, else the disease is passed back and forth from one to another. It is also important that all underclothing, bedding, towels, etc., things that come in contact with the body, be *boiled* when washed.

All cases of scabies should be excluded from school until cured.

Pediculi Capitis (*Head Lice*).—An extremely common accident among children, either from wearing each others' hats and caps, or hanging them on each others' pegs, or from combs and brushes. No person should be blamed for *having* lice,—only for *keeping* them.

The irritation caused by vermin in the scalp leads to scratching, which in turn causes an inflammation of the skin of the neck and scalp. The skin then easily becomes infected with some of the pus-producing germs, and large or small scabs and crusts are formed from the dried matter and blood. Along with this condition the glands back of the ears and in the neck become swollen, and may be very painful and tender.

The condition of pediculosis is most easily detected by looking for the eggs (nits), which are always stuck onto the hair, and are not readily brushed off. The condition is best treated by killing the living parasites with crude petroleum, and then getting rid of the nits. With boys, this is easy,—a close hair cut is all that is needed; with girls, by using a fine-toothed comb wet in alcohol or vinegar, which dissolves the attachment of the eggs to the hair. All combs and brushes must be carefully cleansed.

Children with pediculosis should be excluded from school until their heads are clean. By chapter 383, Acts of 1906, parents who neglect or refuse to care for their children in this respect may be prosecuted under the compulsory attendance law.

Ringworm.—A vegetable parasitic disease of the skin and scalp. When it occurs upon the skin, it yields readily to treatment; but upon the scalp it is extremely chronic. Ringworm of the skin usually appears on the face, hands or arms,—rarely upon the body,—in varying sized more or less perfect circles. One or more, usually not widely separated, may be present at the same time. All ringed eruptions upon the skin should be examined for ringworm.

When the disease attacks the scalp, the hairs fall or break off near the scalp, leaving dime to dollar sized areas nearly bald. The scalp in these areas is usually dry and somewhat scaly, but may be swollen and crusted. The disease spreads at the circumference of the area, and new areas arise from scratching, etc.

Another disease, somewhat like ringworm of the scalp, is known as favus,—a disease much more common in Europe than America. In this disease quite abundant crusts of a yellowish color are present where the process is active. The roots of the hair are killed, so that the loss of hair from this disease is permanent, a scar remaining when the condition is cured.

Care must be taken to see that all combs and brushes are thoroughly cleansed, and to prevent children wearing each others' hats, caps, etc.

Children with ringworm should not be allowed to attend school.

Impetigo.—A disease characterized by few or many large or small flat or elevated pustules or festers upon the skin. The condition is often secondary to irritation or itching diseases of the skin (hives, lice, itch), and scratching starts up a pus infection.

The disease most often appears upon the face, neck, and hands, less often upon the body and scalp. The size of the spots varies very much, and they often run together to form on the face large superficial sores, covered with thick, dirty, yellowish or brownish crusts.

The disease is contagious, and often spread by towels and things handled.

Children having impetigo should not be allowed to attend school until all sores are healed and the skin is smooth.

Diseases of the Bones and Joints

All noticeable lameness, whether sudden or continued, may indicate serious joint trouble, or may be due to improper shoes. These cases, as well as curvatures of the spine, as indicated by habitual faulty postures at the desk or in walking, should be referred for medical inspection.

Spinal curvature should be suspected when one shoulder is habitually raised or dropped, or when the child leans to the side, or shows persistent round shoulders.

Complaints of persistent "growing pains" or "rheumatism" may be the earliest signs of serious disease of the joints.

Some General Symptoms of Disease in Children which Teacher should notice, and on Account of which the Children should be referred to the School Physician

Emaciation.—This is a manifestation of many chronic diseases, and may point especially to tuberculosis.

Pallor.—Pallor usually indicates anemia. Pallor in young girls usually means chlorosis,—a form of anemia peculiar to girls at about the age of puberty. It is usually associated with shortness of breath; the general condition otherwise usually appears good. Pallor may also be a manifestation of disease of the kidneys; this is almost invariably the case if it is associated with puffiness of the face.

Puffiness of the Face.—This, especially if it is about the eyes, points to disease of the kidneys; it may, however, merely indicate nasal obstruction.

Shortness of Breath.—Shortness of breath usually indicates disease of the heart or lungs. If it is associated with blueness, the trouble is usually in the heart. If it is associated with cough, the trouble is more likely to be in the lungs.

Swellings in the Neck.—These may be due to mumps or enlargement of the glands. The swelling of mumps comes on acutely, and is located just behind, just in front and below the ear. Swollen glands are situated lower in the neck, or about the angle of the jaw. They may come on either acutely or slowly. If acutely, they mean some acute condition in the throat. If slowly, they are most often tubercular. They may also be the result of irritation of the scalp or lice in the hair.

General Lassitude, and Other Evidences of Sickness.—These hardly need description, but may, of course, mean the presence or onset of any of the acute diseases.

Flushing of the Face.—This very often means fever, and on this account should be reported.

Eruptions of any Sort.—All eruptions should be called to the attention of the physician. It is especially important to notice eruptions, because they may be the manifestations of some of the contagious diseases. The eruption of scarlet fever is of a bright scarlet color, and usually appears first on the neck and chest, spreading thence to the face. There is often a pale ring about the mouth in scarlet fever, which is very characteristic. There is usually a sore throat in connection with the eruption. The eruption of measles is a rose or purplish red, and is in blotches about the size of a pea. It appears first on the face, and is usually associated with running of the nose and eyes. The eruption of chicken pox appears first as small red pimples, which quickly become small blisters.

A Cold in the Head, with Running Eyes.—This should be noticed, because it may indicate the onset of measles.

Irritating Discharge from the Nose.—A thin, watery nasal discharge, which irritates the nostrils and the upper lip, should always be regarded with suspicion. It may mean nothing more than a cold in the head, but not infrequently indicates diphtheria.

Evidences of Sore Throat.—Evidences of sore throat, such as swelling of the neck and difficulty in swallowing, are of importance. They may mean nothing but tonsilitis, but are not infrequently manifestations of diphtheria or scarlet fever.

Coughs.—It is very important to notice whether children are coughing or not, and what is the character of the cough. In most cases, of course, the cough merely means a simple cold or slight bronchitis. A spasmodic cough, that is, a cough which occurs in paroxysms and is

uncontrollable, very frequently indicates whooping-cough. A croupy cough, that is, a cough which is harsh and ringing, may indicate the disease diphtheria. A painful cough may indicate disease of the lungs, especially pleurisy or pneumonia. A long-continued cough may mean tuberculosis of the lungs.

Vomiting.—Vomiting usually, of course, merely means some digestive upset. It may, however, be the initial symptom of many of the acute diseases, and is therefore of considerable importance.

Frequent Requests to go out.—Teachers are too much inclined to think that frequent requests to go out merely indicate restlessness or perversity. They often, however, indicate trouble of some sort, which may be in the bowels, kidneys or bladder; therefore, they should always be reported to the physician.

The Teeth

Unclean mouths promote the growth of disease germs, and cavities in the teeth are centers of infection. Pus from diseased teeth seriously interferes with digestion and poisons the system. It causes a lowering of vitality and renders mental effort difficult. Diseased teeth, temporary as well as permanent, are frequently the cause of abscesses, and should be carefully watched and treated.

Irregularities of the teeth, especially those which make it impossible to close the teeth properly, lead to faulty digestion, to mouth-breathing, and to other diseases and evils which an insufficient supply of oxygen produces.

The first permanent molars are perhaps the most important teeth in the mouth, and are the most frequently neglected, because they are so often mistaken for temporary teeth. (It should be remembered that there are twenty temporary teeth, ten in each jaw, and that the teeth that come at about the sixth year immediately behind each last temporary tooth—four in all—are the first permanent molars.)

The teacher should be on the lookout for pain or swelling in the face. When the child keeps the mouth constantly open, an examination of the teeth should be made. When symptoms of indigestion occur, or physical weakness or mental dullness is observed, the teeth should be inspected. It should be remembered that disease of the ears, disturbances of vision and swelling of the glands of the neck may be caused by diseased teeth.

It should be known that decay of the teeth is caused primarily by the fermentation of starchy foods and sugars, and that the greatest factor in preventing dental caries is the removal of food particles by

frequent brushing. Children should be prevented from eating crackers and candy between meals, and when possible the teeth should be cleaned after eating. Inspection of the teeth by a dentist should be made at least once in six months.

Nervous Troubles and Mental Defects

Teachers and medical inspectors of the schools should investigate children who show certain physical and mental symptoms. Especially should they take notice of the presence of these symptoms in a child who did not formerly show them. The most important of these are the following:

I.—Restlessness and inability to stand or sit quietly, in a previously quiet child, especially if to this is added irritability of temper and loss of self-control, as shown by crying for trifles, or inability to keep the attention fixed.

There may also be present quick, twitching movements of the muscles of the trunk, face, and especially of the hands, fingers, arms or legs. If severe, these may cause the child to drop things, render its work awkward, or interfere with buttoning the clothes, writing or drawing. Such children are often scolded for being inattentive or careless.

These symptoms are the slighter ones of chorea (St. Vitus' dance). With these should not be confounded other forms of twitching of muscles, such as the blinking of the eyelids, the slower twitching movements of the face or shoulders, or other parts of the body, often called habit spasms, which may be due to defects of vision, adenoid growths or other reflex causes. These latter cases do not usually need to be withdrawn from school work, though often requiring treatment; while the former class should be removed from school at once, both for the child's sake and to prevent an epidemic of imitative movements, such as sometimes occurs.

II.—Another class of symptoms requiring investigation are repeated faintings, especially if the child's lips become blue; attacks, often only momentary, in which the child stares fixedly and does not reply to questions, or in which he suddenly stops speaking or whatever he is doing, and is unaware of what is going on about him. These lapses of consciousness may be accompanied also by rolling up of the eyes, drooling, or unusual movements of the lips, and often appear like a "choking" attack.

Sudden attacks of senseless movements of various sorts, such as twisting and pulling at the clothes or handkerchief, fumbling aimlessly at the desk, especially if there is no recollection afterwards of what was done, are often another expression of the same conditions.

Such attacks, particularly if repeated at varying intervals, even when not accompanied by complete loss of consciousness, are frequently as characteristic of epilepsy as the severe convulsions.

Epileptic convulsions usually involve the entire body in sharp jerking movements, with blueness of the face or lips, complete loss of consciousness, and are usually followed by a period of sleep or drowsiness, and are frequently accompanied by frothing at the mouth, biting of the tongue, and occasionally by wetting or soiling of the clothes.

Another class of convulsions is the hysterical, which are often difficult to distinguish. The hysterical convulsion, however, differs from the epileptic in the following respects. The hysterical patient often shouts, cries or raves, not only previous to but frequently throughout the attack, and is often able to reply to questions during the convulsion. The epileptic gives a single cry, immediately followed by unconsciousness and the spasm. The movements in the hysterical convulsion are often accompanied by bowing of the body backward, and very frequently simulate intentional or voluntary movements, such as tearing the hair, pulling at the clothes, and such things; while the epileptic movements are characterized by their jerking or twitching character. The hysterical patient, also, in place of a convulsion, may strike an attitude, such as of fear or entreaty, often accompanied by raving or singing. This again may follow the convulsion, taking the place of, and strikingly contrasted with the almost invariable sleep of the epileptic, which is almost never seen in hysteria. Hysterical patients if they fall seldom injure themselves by the fall, as epileptics frequently do. Biting the tongue almost invariably indicates an epileptic seizure, as does wetting or soiling the clothes when it occurs.

Cases of epilepsy, whether mild or severe, require treatment, and advice as to whether they should be removed from school. Many cases do not require to be withdrawn from school, and are benefited by its discipline.

III.—Excessive nerve fatigue, which is shown by irritability or sleeplessness, may indicate a neurasthenic condition, that is, a threatened nervous breakdown. Such symptoms may be due to irregular habits, want of proper sleep, lack of suitable food, poor hygienic conditions, or simply from the child being pushed in school beyond its physical or mental capacity.

Excessive fear or morbid ideas, bashfulness, undue sensitiveness, causeless fits of crying, morbid introspection and suspiciousness may also be symptoms of a neurasthenic condition, and call for investigation, and for the teacher's sympathy and winning of the child's confidence, to prevent developments of a more serious nature.

This nerve fatigue may result in a child being unable for the time being to keep up in its work in school.

Forgetfulness, loss of interest in work and play, desire for solitude, untidiness in dress or person, and like changes of character, are sometimes incidental to the period of puberty.

IV.—Mentally defective children in the public schools exhibit certain common characteristics. The essential evidence of mental defect is that the child is persistently unable to profit by the ordinary methods of instruction, as shown by lack of progress or failure of promotion through lack of capacity. After one, two or three years in school, they are either not able to read at all, or they have a very small and scanty vocabulary. One of the most constant and striking peculiarities is the feebleness of the power of voluntary attention. The child is unable to fix his attention upon any exercise or subject for any length of time. The moment his teacher's direction is withdrawn, his attention ceases.

These children are easily fatigued by mental effort, and lose interest quickly. They are not observant. They are often markedly backward in number work. They are especially backward in any school exercise requiring judgment and reasoning power. They may excel in memory exercises. They usually associate and play with children younger than themselves. They have weak will-power. They are easily influenced and led by their associates. These children may be dull and listless, or restless and excitable. They are often wilful and disobedient, and liable to attacks of stubbornness and bad temper. The typical "incorrigible" of the primary grades often is a mentally defective child of the excitable type. They are often destructive. They may be cruel to smaller children. They are often precocious sexually. They may have untidy personal habits. Certain cases with only slight intellectual defect show marked moral deficiency.

The physical inferiority of these defective children is often plainly shown by the general appearance. There is generally some evidence of defect in the figure, face, attitudes or movements. They seldom show the physical grace and charm of normal childhood. The teeth are apt to be discolored and to decay early.

It is a most delicate and painful task to tell a parent that his child is mentally deficient. This duty should be performed with the greatest tact, kindness and sympathy. It would be a great misfortune for the school physician and teacher, as well as for the child, to designate a pupil as feeble-minded who was only temporarily backward.

Temporary backwardness in school work may be due to removable causes, such as defective vision, impaired hearing, adenoid growths in

nose or throat, or as the result of unhappy home conditions, irregular habits, want of proper sleep, lack of suitable food, bad hygienic conditions, etc. Great care must always be used in order not to confound cases of permanent mental deficiency with cases of temporary backwardness in school work, due to the causes mentioned above, or those described under the head of excessive nervous fatigue.

In some cases, where the existence of mental defect is in doubt, accurate information is usually to be obtained in the early history of the child. The time of first "taking notice," the time of recognition of the mother, that of beginning to sit up, to creep, to stand, to walk and to talk should be learned. Marked delay in development in these respects is usually found in all pronounced cases of mental deficiency.

It may be found useful to require teachers to refer at stated intervals to the medical inspectors for examination all children who, without obvious cause, such as absence or ill health, show themselves unable to keep up in their school work, who are unable to fix their attention, or are incorrigible,—though it does not follow that all such cases have either physical or mental defects.

School Hygiene

The school physician should notice the ventilating, lighting and heating of the rooms, and the location of the source of water supply with reference to possible pollution. In case pollution of the water supply is suspected, application should be made to the State Board of Health for an examination of the water. The general cleanliness of the schoolroom is of importance, and the admission of sunlight when possible is desirable.

The Closets.—The school physician, accompanied by the janitor of the school, should inspect the toilet rooms, to see if the floors are clean and dry, that the bowls of the closets are properly emptied and kept clean. (If outhouses are used, a large supply of earth will aid in keeping the place in a sanitary condition.) A few simple directions as to the cleanliness of the room should be posted in the closets.

Cups.—The use of one drinking cup for a number of children is to be condemned, as tending to spread the infectious diseases from child to child. The so-called hygienic drinking fountain, now in more or less general use in progressive cities and towns, is to be recommended where running water is available. If there is no running water, each child should use his own cup.

School Furniture

Any proper sort of school furniture should furnish a seat of such height that the feet will rest easily on the floor. It should have a desk high enough not to touch the knees. It should have a desk low enough for the arm to rest on comfortably without much raising of the elbow; not, however, so low that the scholar must bend down to write on it.

The seat should be near enough so that the scholar may reach the desk to write on it without leaning forward more than a little, and without entirely losing the support of the backrest. The seat should not be so close as to press against the abdomen nor near enough to interfere with easy rising from the seat. This means a distance of ten and one-half to fourteen and one-half inches from the edge of the desk to the seat back; it also means that the seat must not project under the desk more than an inch at most.

The seat should have a backrest that will support the "small of the back" properly, without having the scholar lean back excessively. Whether it also supports the rest of the back or not is of small consequence; support of the back carried up to the level of the shoulder blades is likely to do more harm than good.

These are given as the minimum requirements. Whether or not regular adjustable furniture is in use, we should not be content with less than the accomplishment in one way or another of these primitive adjustments. More accurate adjustment is desirable, and less care in adjusting would be hard to justify, in the light of our present knowledge of the results of faulty attitude.

APPENDIX II

ANNUAL REPORT FOR 1910 OF THE CHIEF MEDICAL OFFICER OF THE BRITISH BOARD OF EDUCATION

The following pages reproduce the table of contents of the Annual Report of the Chief Medical Officer of the British Board of Education. This table is printed to show the range of subjects and topics treated in a thorough and comprehensive report of a system of medical inspection. The report from which this material is taken is probably the clearest, most thorough, and most complete report on medical inspection that has yet appeared. It may well serve as a model for medical officers reporting on work in American communities.

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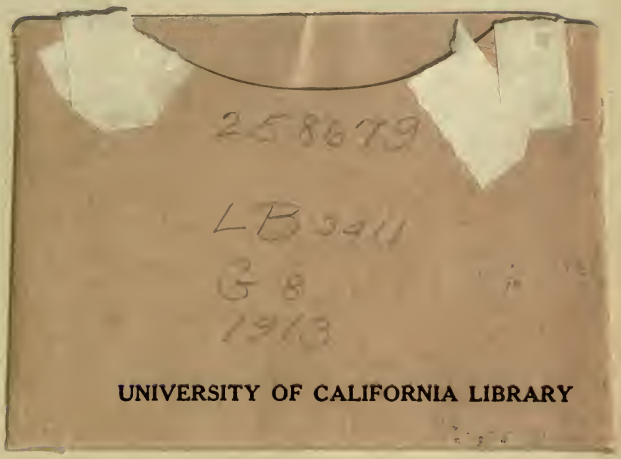
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